The Veterinary Record

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

No. 13. APRIL 1, 1939. VOL. 51.

Some Observations on Dental Disease in the Dog

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ROYAL VETERINARY COLLEGE

The incidence of disease of the teeth in the dog is so high that dental surgery occupies a prominent place in the work of the veterinarian engaged in small-animal practice. The most common affection necessitating surgical interference is paradontal disease. Dental caries, while it does occur in the dog, is comparatively rare. Hypoplasia of the teeth is not uncommon, as also is persistence of deciduous teeth after eruption of the corresponding permanent members. Traumatic lesions such as fracture sometimes call for surgical interference, as also may developmental abnormalities such as supernumerary teeth, odontomata, etc.

PARADONTAL DISEASE*

This name has been taken from human dental pathology and implies disease of the structures intimately associated with, but exterior to the teeth, rather than of the tooth substance itself. Pyorrhoea alveolaris is another name for the disease. In the dog there would appear to be certain differences in the clinical course of the disease as compared with man. It commences by the deposition of calculus adjacent to and under the gingival margins of the teeth. This deposition is greatest on the labial aspect of the upper canines and cheek teeth, on the lingual aspect of the incisors, and all around the base of the lower canine. The gum margins become congested, swollen, painful and readily bleed. As the condition progresses the gum becomes eroded, exposing the roots of the teeth and the margins of the bony alveoli. Infection of the periosteum of the alveoli (periodontal membrane) is followed by loosening of the teeth. On removal of such teeth their roots are found to be, to a variable degree, atrophied. Often the mucous membrane of the lips and cheeks contiguous to the affected teeth becomes inflamed and ulcerated. There are great variations in the extent of the disease, the number of teeth involved and the rate at which it progresses. Its distribution is not regular. The canines are generally amongst the first to be involved, but, consequent upon the great size of their roots, they are often the last to loosen. In the prognathic and epignathic types of skull the incisors are generally affected early. The upper cheek teeth are affected before the lower, especially the carnassials (4th Pm.) and first molars, upon which there may be large accumulations of calculus. Sometimes a case will be met in which the canines and incisors are extensively involved while the premolars and molars are healthy. In another case the converse may exist, while in a third, one side of the mouth may be comparatively healthy and the other seriously diseased. In long-standing cases all the teeth may be involved. Sometimes there is an extensive ostitis of the jaw-bones, and possibly hard palate. It occurs chiefly in the vicinity of those teeth with extensive roots which are not readily shed spontaneously —the canines, especially the lower, and the carnassials. Necrosis of the outer alveolar plate of the upper carnassial gives rise to a characteristic sinus of the face. The disease is often associated with fibrous hypertrophy of the gums and occasionally the development of malignant neoplasms. The majority of cases occur in animals past middle-life and in general it may be taken that the older the animal is the more likely it is that the disease will be present. At the same time it must not be inferred that all aged dogs have diseased teeth. Many are encountered in which dentition is almost perfect. Again, it is not to be assumed that it does not occur in young dogs, for many animals of one to two years old will be met in which the disease has already established a foothold and by three to four years has become extensive.

Etiology.—Not only has there been a great deal of clinical speculation as to the factor or factors which predispose man and animals to paradontal disease, but in addition a considerable amount of careful research work has been carried out. In this country May Mellanby[1 2] has made most comprehensive investigations into the influence of diet on dental disease. Her work is of great interest to veterinarians

*The writer is indebted to Sir Frank Colyer for the advice that "paradontal disease" is the appropriate name for the condition as it occurs in the dog.

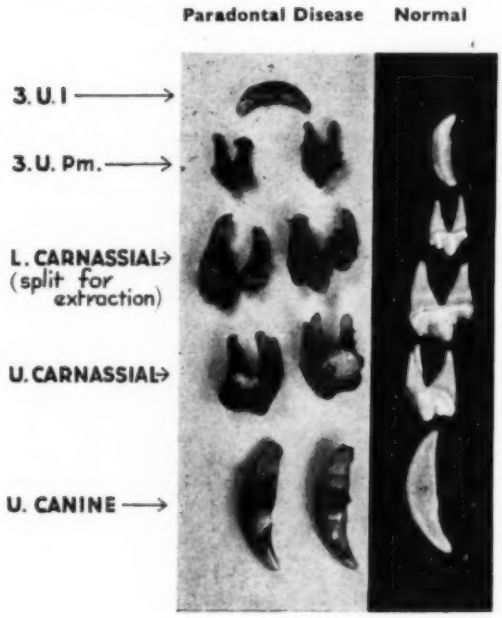

FIG. 1 (*Photograph reduced*).

because much of it was done on dogs. She has shown that the general development, character and microscopical structure of the permanent teeth can be greatly influenced by the diet during the eighth to twenty-fourth weeks of a puppy's life. She has established the importance of vitamin D to ensure perfect dental development and has also discovered the deleterious effect that an excess of cereal in the diet during this critical period may have upon the calcification of the teeth. From this evidence it must be concluded that the feeding of puppies on dried milk products and meals consisting largely of cereal, a practice often adopted by dog breeders, is a predisposing factor to dental disease. Again, she has shown that the healthy development of the periodontal tissues is dependent upon an adequate supply of vitamins A and D in the diet. A deficiency of vitamin A leads to hyperplasia of the subgingival epithelium and predisposes to its subsequent invasion by pathogenic organisms; while deficiency of vitamin D results in defects in alveolar bone. On reviewing one's practical experience, however, it is found that the vast majority of puppies develop what—macroscopically, at any rate—appear to be perfectly normal teeth, despite the fact that since weaning the diet has been quite haphazard. Moreover, when questioning the owners of aged dogs which have perfect dentition, regarding their diet throughout life, one is quite unable to detect any special provision for vitamins or minerals. In fact the converse has often been the case, for dental disease has frequently been seen in comparatively young dogs in which the diet has been meat and milk.

The late Henry Gray,[3,4] one of our most critical clinical observers, for long had held the view that lack of function is the most important predisposing factor to dental disease in the dog. It is an aspect of the subject which, as far as the writer knows, has not occupied the attention of the research worker. Yet it would appear to be most rational to assume that the maintenance of a healthy state of the periodontal tissues is largely dependent upon proper functioning of the teeth. We are quite familiar with atrophy of muscle and decalcification of bone consequent upon loss of function. It might be well to consider the normal, physiological function of the dog's teeth. The task of the canines is to penetrate and tear the tissues of the dog's prey. The incisors serve to grip and tear away chunks of flesh, while the sectorial cheek teeth serve to cut these chunks into pieces of a size suitable for swallowing. The shear-like carnassials will cut bone, while the tuberculate molars serve to crush it. The dog does not masticate. Under conditions of domestication when animals are fed on cut-up meat, biscuit mashes and that form of "Irish stew" so frequently fed to greyhounds, their teeth carry out no function at all other than the slight incisor effort associated with prehension. This argument may be construed in favour of feeding hard dog biscuit. One can only say that a diet comprising more than 80 per cent. cereal cannot be correct for a carnivorous animal. Despite these comments on lack of function it must again be admitted that one often encounters aged dogs with good dentition in which there is no indication that diet has been directed towards provoking dental function.

The development of breeds with exaggerated skull abnormality would appear to be another predisposing factor. In the markedly brachycephalic types the cheek teeth are crowded together with their long axes directed obliquely and their anterior roots invading the hard palate. Such breeds are often severely prognathic, so that not only is molar function greatly reduced but incisor function is entirely absent. On examining one's clinical evidence one finds that the incidence of dental disease in the Pekinese breed is very high. In the bulldog and mastiff, however, it is comparatively low. Again in Pomeranians and certain of the spaniels—breeds with comparatively normal skulls—dental disease may be high. The possibility that heredity plays a part in predisposition to dental disease cannot be ignored.

Unfortunately under conditions of clinical practice it is impossible to obtain reliable evidence on this point.

That debilitating disease is productive of dental disease cannot be disputed, and in the dog canine distemper is the chief offender. When puppies have become infected with the disease during the second and third months of their lives, the permanent teeth on eruption frequently show severe dental hypoplasia. Again, in older dogs which already possess their permanent teeth one of the first signs of the disease is oral foetor; an accumulation of yellow scum on the teeth, and a marginal gingivitis. In many of these tartar deposit and paradontal disease develop early. Uraemic intoxication is another common disease of the dog which provokes dental disease. A rapidly progressive pyorrhoea develops which gives the breath a characteristic acid odour which the clinician recognises as the uraemic mouth. Associated with the same disease an *osteitis fibrosa* of the jaw-bones is sometimes seen. It must not be thought that it is the writer's suggestion that chronic paradontal disease is the cause of chronic nephritis, for that certainly is not his view. Whilst the two diseases may co-exist, many cases of severe dental disease occur in animals in which kidney function is normal, and conversely many cases of chronic nephritis occur in which, up to the onset of severe uraemia, dentition was good. The writer has been unable to correlate the incidence of dental disease with that of urinary lithiasis. Clinically there would appear to be no connection between the two.

Clinical Features.—The first abnormality observed by the owner of the animal is oral foetor and advice is sought because the animal's proximity is objectionable. As yet there are no marked objective symptoms; food is still taken normally and there is no loss of flesh. As the disease progresses pain is indicated by a disinclination to tackle hard food. Salivation occurs, and it may be blood-tinged. Mere reflection of the lips generally affords sufficient evidence of the presence of the disease, but in order to ascertain its extent, assess the appropriate treatment and be in a position to express a sound prognosis, it may be necessary to complete the examination with the animal under the influence of a narcotic or general anaesthetic, for interference with the inflamed mouth may be greatly resented. On no account should forcible restraint, such as gagging, be applied, for this may result in frenzied struggling. In early cases in which the lesions comprise a slight accumulation of calculus with a mild inflammation of the gum margins, the removal of the former by scaling and the treatment of the gums with mild, astringent and antiseptic lotions, may serve to delay the progress of the disease. Attention should be paid to the diet. Ensure that it contains vitamins A and D by including cod liver oil, butter or beef fat. Milk will serve as a source of minerals, whilst meat in lumps or, better still, attached to the bone, will serve to provoke function. In all cases in which the bony alveoli are involved extraction of the tooth is indicated. Once this is carried out the gum and the alveolus heal with amazing rapidity in the majority of cases. The facility with which the operation can be effected will depend upon a number of factors, including the particular teeth involved and the nature of their roots. The removal of incisors and premolars 1, 2 and 3 is usually simple. The carnassials, particularly those of the lower jaw, may present great difficulty unless considerable loosening has occurred. It is often impossible to extract canines unless the alveolus is severely affected and the tooth very loose. Needless to say, the size of the animal, and in consequence the size of its teeth, will influenze operation. It may be taken as positive once the alveolus is involved that healing will not occur until the tooth is removed, and the longer its removal is delayed the greater is the danger that severe, and possibly incurable, disease of the bone may be present. Thus before embarking on operation in severe, long-standing cases this possibility should be seriously considered. Again, when dealing with the mandibular canines and carnassials there is a risk that fracture of the diseased jaw-bone may result from the surgical interference. In severely affected mouths the extent of interference to be carried out at one time must be carefully considered, for often haemorrhage from gum and alveoli is severe. Unfortunately cases will be met, often in comparatively young dogs, in which disease of the gums and the adjacent mucous membrane of the lips, is rapidly progressive, without any tendency to loosening of the teeth. Extraction, particularly of the canines, carnassials and molars may be impossible. Such cases represent a difficult problem. The writer's efforts, which have extended from the use of simple antiseptics to cauterisation with silver nitrate, have been attended by very little success. Finally it must be borne in mind that the disease may co-exist with chronic nephritis; in fact, at the time of presentation the animal may be in a state of acute uraemia. The owner often ascribes all its trouble to the teeth. The veterinarian must beware that he does not embark upon an extensive dental interference without first taking steps to assess kidney functino.

Facial Sinus

A quite common disease in the dog is the development of an abscess on the side of the face beneath the eye. The lesion eventually

bursts and a sinus develops. The condition is generally unilateral but may be bilateral. It has been described as pus in the antrum—the writer believes this description to be quite wrong. (See Figs. 2 and 3.) In the great majority of cases it is due to necrosis of the outer alveolar wall, primarily adjacent to the large, posterior root of the upper carnassial tooth, but in long-standing cases spreading forwards and backwards. In some cases examination of the tooth reveals paradontal disease. In quite a number the writer has found the external surface of the tooth to be fractured, a shell-like portion having been cast off and the bony alveolus exposed. In one case perforation of the crown of the first upper molar by caries and subsequent infection of the roots was the cause. In a number of cases the crown of the carnassial and its contiguous gum appear to be normal.

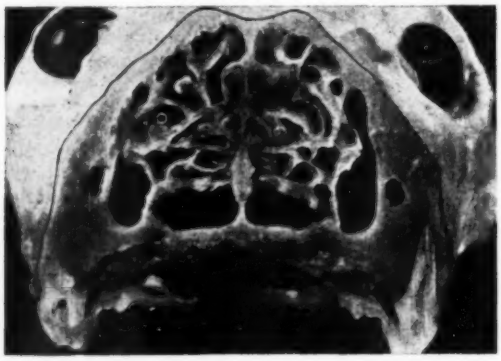

Fig. 2.—Cross-section of dog's upper jaw through the carnassial tooth to demonstrate the sites of the maxillary sinus and the infraorbital canal in relation to the roots of that tooth.

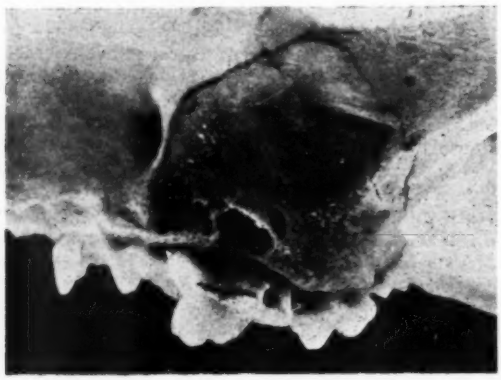

Fig. 3.—Necrosis of the maxilla adjacent to the roots of the carnassial tooth resulting in facial sinus.

Treatment comprises extraction of the tooth and curettage of the diseased bone. In a recent case—one which has not yet burst—the abscess cavity should be thoroughly exposed. Prognosis depends upon the extent of the bone lesion. In many cases extraction of the tooth is followed by rapid recovery, despite the fact that the sinus may have been in existence for a year or more. In others even extensive surgical interference may fail to effect a cure; the gum wound rapidly heals but the sinus persists.

Dental Hypoplasia

This term is a very broad one signifying imperfect development of the teeth. Mellanby (May) has shown that hypoplasia of the permanent teeth can readily be produced experimentally by a deficient diet, and concludes that vitamin D deficiency is the essential cause. The writer's experience is that in the vast majority of puppies, permanent dentition at the time of eruption is normal. Rachitis is not a common disease in the puppy and when it occurs abnormalities of the teeth are not one of its prominent features. Dental hypoplasia, however, of a type which appears to be identical with that described by Mellanby, does occur naturally in the dog. In such cases it is almost the invariable history that the puppy has suffered from canine distemper during the period of permanent tooth development, *i.e.*, between the tenth and twentieth weeks of life. Whether it is the result of a direct action of the canine distemper virus, or due to the fact that there has been a general dietetic deficiency consequent upon inappetence during this period, is not known. It may be significant that the condition has been seen in animals which have been vaccinated against distemper during this critical period of dental development. A striking feature is that the deformed teeth show no special proneness to accumulation of calculus, paradontal disease or caries, in fact they generally remain unchanged throughout life.

The clinical manifestations of the condition vary. In some cases the teeth on eruption are found to be small and misshapen. Some, especially the first, second and third premolars, may fail to develop. The enamel is of poor quality and is often stained a greyish-brown hue. In others, parts of the crowns may be denuded of enamel. This absence of enamel may comprise small, circular pits exposing the dentine, or it may be extensive and irregular, involving the greater part of the crowns. There is no treatment.*

*Since writing these notes a striking case of dental developmental failure has been observed.

Subject.—An eight-month-old Spaniel cross male. Condition robust with no evidence of

FIG. 4.—DENTAL HYPOPLASIA
Specimen—A six-month-old Aberdeen terrier female. Canine distemper.

IRREGULARITIES IN THE SHEDDING OF THE DECIDUOUS TEETH

This is a common dental abnormality in the dog necessitating surgical interference. The canine teeth are most often involved, although cases will be met in which double incisor and canine dentition is complete. Whilst it is assumed that the exciting cause of the condition is failure of the permanent tooth to develop immediately beneath the deciduous member and thus absorb its root, the predisposing cause is unknown. A distinct breed and even family tendency to the condition has been noticed. It is especially common in the toy Pomeranian, Yorkshire and Aberdeen terrier breeds. Failure to shed a deciduous canine may result in the permanent tooth taking a wrong direction. The lower canine may be directed into the mouth, its point setting up an inflammation of the palate. When the deciduous canine persists in the upper jaw the permanent tooth erupts and develops anterior to it; and in the lower jaw medial to it. This arrangement is quite constant. The lower canine normally occupies intimately the space between the upper third incisor and the upper canine. Persistence of the upper deciduous canine may, by the consequent abnormal position of its permanent member, so occlude this space that the mouth cannot be properly closed. When the deciduous incisors persist the eruption of the permanent teeth is on their lingual aspect. Should a deciduous tooth persist after its corresponding permanent member has been erupted it should be extracted as soon as possible.

CARIES

Whilst the incidence of caries in the dog is not to be compared with that of paradontal disease, it is by no means rare, for the writer comes into contact with two or three cases every year. The teeth primarily attacked by the disease, and in the majority of cases the only teeth affected, are the first and second molars of the upper jaw. The condition is almost always bilateral. Occasionally the second and third molars in the lower jaw are affected. It will be recalled that these are the teeth having tuberculate "masticatory" crowns, situated behind the shear-like carnassials. On three occasions it has been seen in the lower carnassial. This tooth has a quite well-developed tuberculate crown behind its sectorial portion. The writer has not seen the disease in the incisors, canines, premolars or upper carnassial. In all cases the animals have been middle aged (four to six years) or aged. The lesion commences in the centre of the "masticatory" surface between the tubercles, as a small circular decalcified area of enamel exposing the underlying dentine which appears greyish in colour. Decalcification of the dentine progresses rapidly, exposing the nerve fibrils in the pulp. The cavity enlarges and the crown becomes shell-like, discoloured and easily broken. The disease is not associated with pyorrhoea or deposits of calculus; in fact, apart from the carious teeth the mouth is generally healthy.

Etiology.—It is generally accepted in human dental pathology that, whatever the predisposing causes to caries may be—dietetic deficiencies, heredity, etc.—the exciting cause is the bacterial decomposition of carbohydrate food in contact with the teeth with the production of organic acids. These, by dissolving the enamel, allow the tooth substance to be invaded by bacteria. It might be well to consider this theory from the canine viewpoint. Under conditions of domestication soft carbohydrate foods often form a large proportion of the diet—biscuit or bread mashes, potatoes and other vegetables. The dog picks up the food with the incisors and swallows it. There being no mastication, food material is much less likely to remain in the interstices between the teeth than in man. The teeth most likely to become affected would appear to be the incisors, yet it is a fact that these do not become involved in caries. How is the predilection of the first

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rachitis. An enquiry into its history elicited that it had beautiful baby teeth, but that it suffered from a severe illness during the third and fourth months of its life.

Dentition.—Upper jaw.—First and second molars on each side only. The teeth were small and showed enamel erosion. (The left deciduous canine persisted.)

Lower jaw—Right side.—An ill-developed, stained carnassial.

Left side.—The third permanent premolar and the carnassial. Both were stained.

(Both deciduous canines and one deciduous incisor persisted.)

and second upper molars explained? A possible answer is the feeding on hard carbohydrate food—dog biscuits. To cut biscuit into pieces of a size suitable for swallowing the animal uses its carnassials. Considerable force is necessary and this causes carbohydrate to become fixed in the depression between the tubercles of the first molar. It is possible that some injury to the enamel occurs at the same time.

Fig. 5.—Dental Caries, upper first molar. The top two illustrations are normal.

Clinical Features.—The outstanding feature of the history of a case of caries is pain in the mouth. The animal is disinclined to tackle its hard food. It may paw its face or rub its head along the ground. As has been pointed out, the condition is unassociated with pyorrhoea and upon a cursory examination the mouth may appear sound. The "masticatory" surface of the first and second upper molars must be examined. In some cases it may be possible to detect an acid odour of the breath. By the time dental caries provokes symptoms in the dog the pulp cavity of the tooth has become involved and the tooth or teeth should be extracted. Further development of the disease in other teeth has not been seen.

Fracture of a Permanent Tooth.—This accident is sometimes met. It generally results from a street accident or from fighting. A canine may be fractured longitudinally and cases have been encountered in which it is associated with severe haemorrhage from the palatine artery. In some cases the outer alveolar plate is fractured in addition and the tooth loosened. The outer aspect of the upper carnassial is often fissured consequent upon biting some hard object. It often results in the development of a facial sinus.

Fig. 6.—Caries, lower carnassial teeth.

The fractured portion should be removed. If the bony alveolus is exposed and infected the tooth should, if possible, be removed.

Neoplasms of the Gums

Paradontal disease is often associated with fibrous hypertrophy of the gums (dental epulis). The tumour comprises a mass of connective tissue of variable vascularity arising in the gum in the vicinity of one or more teeth. The lesion may be localised—sessile or pedunculated—or it may comprise a diffuse fibrosis of the gums. The epithelium may be intact or ulcerated. The

condition is an inflammatory one and results from local irritation. It is more often seen in the upper than the lower jaw, and its development tends to be greater on the labial than the lingual aspect. It may be associated with the incisors, premolars or molars. In long-standing cases the lesion may surround and almost entirely cover several teeth.

Removal of the cause is the primary aim of treatment and wherever possible the offending tooth or teeth should be removed. If this is impossible thorough scaling should be carried out. If the lesion is pedunculated its removal presents no difficulties. It is carried out with a knife or bone forceps. Healing is generally rapid. It must, however, be pointed out that sometimes a lesion which has the typical appearance of a fibrous epulis is shown, on histological examination, to be malignant, either epithelioma or sarcoma. Such cases recur rapidly after attempts at removal. The gum and palate adjacent to the upper carnassial is sometimes the site of a rapidly developing sarcoma in young dogs. Fig. 7 illustrates such a lesion. The writer has seen a very malignant epithelioma arise in the same position; in fact,

Fig. 7.—Sarcoma of gum adjacent to left upper carnassial in a nine-month-old bull terrier male.

Fig. 8.—Diffuse fibrosis of gums. An aged Airedale male.

Fig. 9.—Sarcoma epulis. Aged mongrel female.

quite recently a one-and-a-half-year-old setter female was met in which a rapidly growing carcinoma had developed on each side of the palate and around the base of the carnassial tooth.

Follicular odontomes are occasionally seen in the dog, associated with the molars in either the upper or lower jaw. The tooth fails to erupt and the lesion comprises a mass of hypertrophied gum and bone. The writer has not seen one become cystic. They cause the dog no inconvenience and are best left alone.

Dental Operations

Scaling the Teeth.

Scaling is performed for the removal of dental calculus. It is especially indicated in early cases before the gum margins and periodontal membrane have become seriously involved. The operation itself is not a painful one, but care should be taken not to wound the inflamed gum with instruments. As to whether the operation is performed with the animal fully conscious or after narcotisation will depend upon the animal's temperament and the extent of the disease.

Great care must be taken when operating on the conscious animal that the eye is not injured by the scaling instrument. When the animal resists it generally does so by suddenly forcing its head downwards, and thus when dealing with the upper molars the eyeball should be protected. After closing the eyelids the thumb of the left hand is pressed against the eye. Points to be borne in mind, to ensure that the operation is thoroughly done, are:—

(1) That the calculus extends under the gums, and thus the scaling instrument should be carefully introduced under their margins.

(2) That it extends between the teeth.

(3) That the buccal aspects of the teeth are also involved, although, as a general rule, to a lesser degree than the lingual.

(4) That loose teeth should be removed.

Numerous scaling instruments are available and a selection is illustrated [Fig. 10B]. It will be found that dental forceps are most useful for removing large masses of calculus. If the latter is squeezed between the jaws of the forceps it generally breaks away in large cusps.

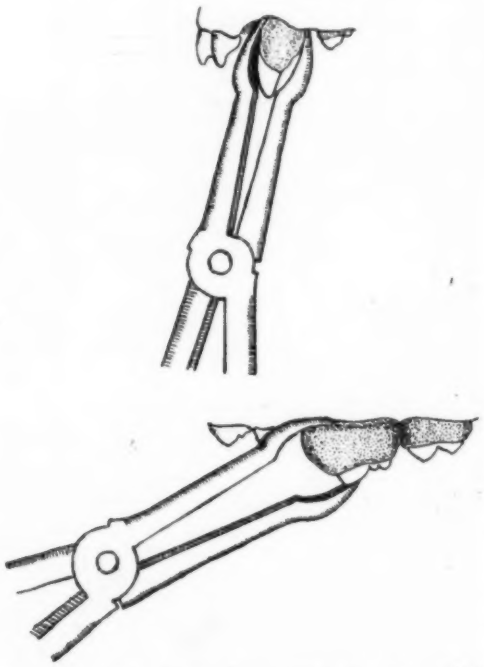

Fig. 10A.—Using dental forceps for the removal of calculus.

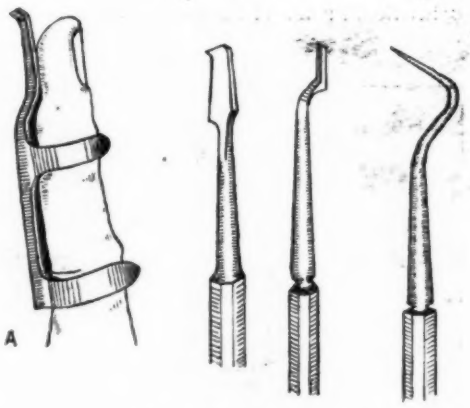

Fig. 10B.—Tooth scalers.

Tooth Extraction.

(*a*) *Deciduous.*—Complete removal of a deciduous canine, especially a lower one, is difficult. The root being so much larger than the crown, the grip necessary to apply effective traction often causes the crown to break close to the gum. This accident, however, is not a serious one, for once the functioning portion of the tooth is removed the root is rapidly absorbed. Incisor forceps are employed and the tooth gripped laterally. In the case of the lower jaw this necessitates forcing one jaw of the forceps between the temporary and permanent teeth. The forceps are pressed, under the gum, as far as the alveolar border and the tooth lightly gripped. Consequent upon the distinct

flattening of the root from side to side, rotation is generally out of the question and it is necessary to loosen the root by gentle lateral pressure. Following this direct traction is applied. The direction of the latter must be in line with the long axis of the root. When applying traction the thumb of the operator's left hand should be pressed against the hard palate in the case of the upper jaw, and against the premolars on the same side in the lower. The extraction of deciduous incisors requires no special description.

(*b*) *Permanent.*—The facility with which a permanent tooth can be extracted will depend chiefly upon whether its root or roots are loose. It should be stated at the outset that the removal of a tooth with sound roots is a difficult, and sometimes impossible, task. Difficulty will be greatest when dealing with those teeth having extremely long (canines) or multiple (carnassials and molars) roots. It will also be greater in the large than in the small breeds. Again, as a general rule, extraction from the mandible is more difficult than from the maxilla. At the same time the indications for the extraction of teeth with sound roots are not numerous, and of them caries is the most important. The carnassials, especially the lower, may present great difficulty. If, after exerting reasonable force, the operator fails, he should consider immediately the advisability of dividing the tooth into two parts and extracting each separately, otherwise there is a risk that he will simply break away the crown. Bone forceps are quite suitable for this operation, but care must be taken that they are applied in the appropriate position and direction to ensure that the tooth is divided between the roots (see Fig. 12). The upper carnassial has three roots, comprising an anterior pair which are comparatively small and laterally placed, and a single, large posterior one. The lower carnassial has two large roots. The upper first molar is difficult to grip unless suitable forceps are available, because of the breadth and flatness of its crown. It is the tooth most often involved in caries, in which case the shell-like crown tends to break under the pressure of the forceps. Its roots (two lateral and one larger medial) are comparatively small. The roots of the upper second molar, whilst disposed similarly to those of the first, are much smaller and often only rudimentary. No attempt should be made to remove canine teeth unless they are appreciably loose, for in the great majority of cases the effort will prove futile. Paradontal disease is the chief indication for extraction in the dog, and in this condition the severely affected teeth are generally loose. Their removal is indicated in every case. Great care must be taken when dealing with the canines

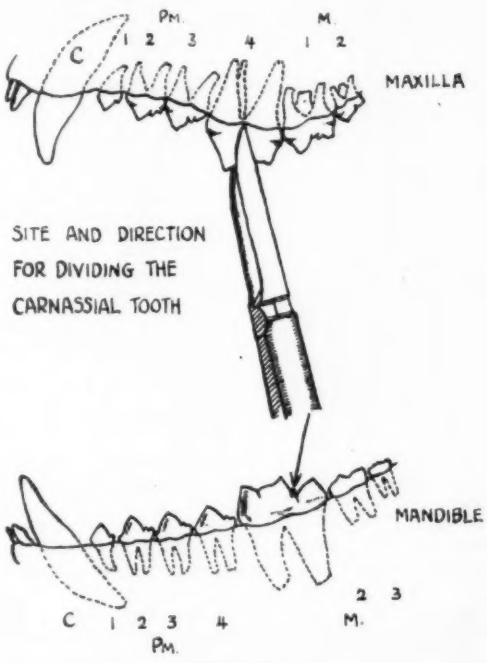

Fig. 12.

Fig. 13.—Paradontal disease. Severe necrosis of mandible adjacent to the carnassial. Fracture of ramus resulting from attempts at extraction.

and lower molars in small subjects, that the jaw is not completely fractured when so doing. The principle when extracting teeth is that the jaw-bones shall not be subjected to excessive force, but that the tooth shall be removed as the result of the opposing forces of the operator's hands. For example, when dealing with the upper jaw, the ball of the left thumb should be pressed forcibly against the hard palate, adjacent to the tooth, whilst the right

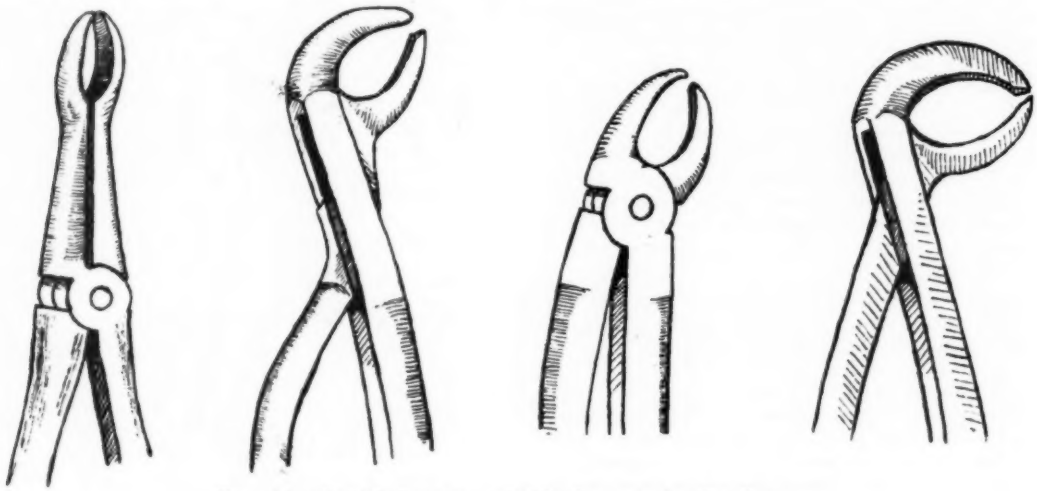

Fig. 14.—Dental forceps suitable for use in the dog.

hand exerts rotating, lateral or traction forces on the forceps. In the lower jaw the thumb is pressed firmly against the tooth in front of, or behind, the one to be removed. The jaws of the forceps should be pressed well under the gums, especially on the labial aspect, so that they grip the root of the tooth close to the alveolar border. In the case of the premolars they tend to insinuate themselves between the roots. Canines, premolars and molars are gripped on their lingual and labial aspects, but incisors are best gripped laterally for the lateral aspects of the roots are flattened and thus serve to accommodate the jaws of the forceps. (The teeth are generally sufficiently loose for the forceps to be insinuated between them.) The direction of the force employed will vary with the respective teeth. Incisors should first be rotated slightly in both directions to break down the periodontal membrane, before applying direct traction. The roots are comparatively long, but there is little tendency for the crown to break. In the case of the upper carnassials, except those which are very loose, it is improbable that direct traction will be effective in the first instance. The periodontal membrane must be broken down and the roots loosened by lateral rocking, after which the tooth is extracted by pulling. It is important that the design of the forceps used is such that the jaws shall not approximate each other too closely, or the crown of the tooth may be broken. In those cases in which the upper carnassials have been split, it is generally easy to extract the anterior portion (carrying the two small roots) by direct traction, but the posterior portion (carrying the single, large root) should first be rotated. Lateral force should not be applied to the lower carnassial. If it is not sufficiently loose that it can be withdrawn by direct traction, it must first be split and each half removed separately by rotation and then traction. In cases of caries of the lower carnassial in large dogs, in which the writer has formed the opinion that all efforts on his part will fail to remove the tooth roots, he has adopted the practice (two cases) of cutting away the crown close to the alveolar border after first reflecting the gum margins. The method has proved successful, the gum healing over the roots. The extraction of the first upper molar requires a little special description. As has already been pointed out, the breadth and flatness of its crown render effective gripping by forceps difficult. It is essential that the jaw of the forceps shall be forced well beneath the crown into the mucous membrane of the palate, for its largest root is the medially placed one. Having effectively gripped it, the tooth is forced outwards, thus loosening this root. Once this is done removal by traction is not difficult. As the mucous membrane of the palate tends to adhere to this tooth it is often necessary to sever it with a knife or scissors. It is unwise to attempt to remove a canine unless it is commencing to loosen, and even then it is well to increase the degree of looseness by first vigorously rotating it and forcing it outwards with the thumb and finger. The forceps are applied and the tooth removed by direct traction, taking care that its direction is the same as that of the long axis of the root.

Haemorrhage after tooth extraction in cases of paradontal disease is sometimes severe. When it occurs attention should be paid to its arrest before proceeding further. Pressure by tampons soaked in cold water is generally effective. In severe cases, one should consider

the use of adrenaline hydrochloride solution (0·1 per cent.) or styptic gauze. In exceptional cases it may be necessary to apply a pressure pad and bandage around the jaws.

It goes without saying that all instruments used for dental operations shall be sterilised by boiling.

Anaesthesia in Dental Surgery

For all but the simplest interferences general anaesthesia is greatly superior to local, even when the latter is combined with morphine narcosis. The mouth of the animal which is the subject of severe paradontal disease is generally most painful and the slightest interferences are resented. Morphine is often insufficient to overcome this and interference may result in struggling and frenzy which is often exaggerated by the influence of the narcotic. The technique of administration of the more recent barbituric acid derivatives has now reached a degree of perfection whereby general anaesthesia can be induced almost without risk. Nembutal and pentothal sodium have the complete confidence of those veterinarians skilled in their administration. Of the two, pentothal is generally the more suitable for dental operations because of the shortness of the duration of anaesthesia. Appropriately administered it can generally be relied upon to give anaesthesia of ten to 15 minutes' duration. When a longer period is required nembutal should be used. The method of administration is that of slow intravenous injection, assessing the depth as injection proceeds. It is not proposed to reiterate the details of the technique of administration, for these have been published on a number of occasions by the writer and his former colleague, Sheppard, M. (*née* Oyler).[5 6 7 8] When operating under general anaesthesia care must be taken that the pharynx is kept free from blood, and the animal should not be returned to its bed until haemorrhage has ceased and the mouth cleansed.

Local anaesthesia (infiltration or infraorbital and mental perineural block) is contra-indicated in paradontal disease for a number of reasons. The first, and most obvious, is the difficulty of administration. Another is that there is a grave risk of carrying infection from the surface of the gum into its depth, and possibly into the vicinity of a sensory nerve trunk. A third is that infiltration anaesthesia is often unsuccessful in inflammatory conditions of the teeth roots and alveoli.

Local Anaesthesia

From the foregoing it will be gathered that it is the writer's opinion that the application of local anaesthesia is strictly limited. After reviewing the chief indications for tooth extraction, the following are those in which it is his opinion that local anaesthesia should be considered:—

(1) Persistent deciduous teeth.

(2) Teeth which have been loosened and possibly displaced as a result of trauma.

(3) Simple teeth—incisors and small premolars which are loose but are not associated with severe disease of the gums.

(4) Caries.

Two methods are available, submucous infiltration and perineural injection. In theory the former is more suitable for single extractions and the latter for multiple.

Submucous Infiltration.

A 2 per cent. solution of procaine hydrochloride with 0·002 per cent. adrenaline hydrochloride is used. A dental syringe should be employed with a needle 0·7 cm. long and 0·5 mm. outer diameter. The writer uses the syringe introduced by the Waite Company. Infiltration is commenced on the labial surface.

Whilst an assistant steadies the animal's head by means of one hand under the chin and the other over the head, the operator retracts the lip with the fingers of the left hand. The gum is disinfected with a little weak iodine solution or surgical spirit. In very nervous subjects it is advisable to first provoke superficial anaesthesia of the gum by the topical application of a 4 per cent. procaine solution applied on a tampon of gauze. Holding the animal's head firmly, the needle is thrust into the gum to its full extent. Its point of entry is about 2 mm. (⅛-inch) from the gum margin and its direction parallel with the tooth root. About 0·2 cm. (3 minims) is slowly injected. Effective infiltration is indicated by a blanching of the gum over a circular area of about 7 mm. (¼-inch) diameter. The needle is withdrawn and after a pause of about one minute, second and third injections are made at the anterior and posterior borders of the primary weal. As considerable pressure is required to infiltrate the gum, Record syringes with detachable needles are generally unsuitable. Next it is necessary to infiltrate the palatine margin of the tooth in a similar manner. To open the mouth, the left thumb is introduced in the premolar region, and the fingers are passed over the nasal bones. By upward pressure with the thumb against the palate, the mouth is opened, and as long as firm pressure is so applied the animal cannot close its mouth. (The author is indebted to Mr. Charles Roberts, M.R.C.V.S., for teaching him this most useful method.) A mouth-gag should not be employed unless the animal is deeply narcotised, because of the distress it causes. If submucous injection is properly performed

on healthy gums, even carnassial and molar teeth can be extracted painlessly. A period of five minutes should elapse after injection before commencing operation.

Perineural Injection.

The sensory nerves to the teeth are derived from the maxillary and mandibular branches of the fifth cranial nerve. The maxillary nerve emerges through the foramen rotundum, passes forwards in the pterygo-palatine fossa, and is continued in the infraorbital canal as the infra-orbital nerve. The nerves supplying the first and second molars leave the main trunk before it enters the canal. During its passage in the canal filaments are given off to the four premolars, together with their alveoli and contiguous gum. The nerve supply to the canine and the incisors arises in the canal and passes forwards in the maxilla and premaxilla. The mandibular nerve passes forwards on the pterygoid muscle and enters the mandibular canal at the mandibular foramen. As it traverses the canal it supplies filaments to the molar and premolar teeth, and gives off a branch to supply the canine and incisors. It emerges at the mental foramen. Dental block in the dog has been studied and a technique of administration devised by Frank, E. R.[9] in America.

Dental nerves are accessible to perineural injection at the following points:—

(1) Infraorbital nerve. (*a*) In the pterygo-palatine fossa at its point of entry into the infraorbital canal. All teeth in the upper jaw on that side will be anaesthetised. (*b*) In the lower part of the infraorbital canal, the injection being made through the infra-orbital foramen. Anaesthesia of the incisors, canine and first two premolars.

(2) Mandibular nerve. (*a*) On the medial aspect of the mandible at the mandibular foramen, the point at which the nerve enters the canal. Anaesthesia of all teeth in the lower jaw on that side. (*b*) In the anterior part of the mandibular canal, injection being made through the mental foramen. Anaesthesia of the lower incisors, canine and first two premolars.

Technique.—Needles of appropriate length, 1 mm. outer diameter. 2 per cent. procaine solution. For making the initial, insensitive weals in the skin and gum an ordinary dental syringe should be employed.

For blocking the infraorbital nerve, Frank makes the injection in the pterygo-palatine fossa. A point is selected one-and-a-half inches (4 cm.) below the lateral canthus of the eye (the head being held horizontal), in the space between the posterior border of the malar bone and the anterior border of the coronoid process of the mandible. The skin is prepared and an insensitive weal is made. A needle two inches (5 cm.) long is used. It is inserted directly through the skin into the soft tissues occupying the space until its point has passed the edge of the malar bone. It is then directed forwards along an imaginary line that would reach the gingival margin of the upper incisor teeth, until its point reaches the maxillary foramen where the nerve is lodged. This is at a distance of one to one-and-a-half inches (2·5 to 4 cm.) from the point of insertion of the needle. 2 c.c. of solution are injected and the head inclined downwards for several minutes.

Injection into the lower part of the infra-orbital canal is made through the gum. The upper lip is retracted and the finger is pressed against the gum immediately over the third premolar tooth at the line of reflection of the mucous membrane of the cheek. The border of the infraorbital foramen will be readily detected. After preparing the gum and making an insensitive weal, a one-inch (2·5 cm.) needle is inserted into the foramen and up the canal for a distance of three-eighths of an inch (1 cm.) and 1 c.c. of local anaesthetic solution injected.

For complete blockage of the mandibular nerve, injection must be made at the mandibular foramen. On passing the finger along the posterior part of the ventral border of the ramus, a depression will be felt. The middle of this depression is the point for insertion of the needle. The latter is inserted at right-angles to the lower jaw and against the mesial aspect of the bone for a distance of one-half to three-quarters of an inch (1·5 to 2 cm.) according to the size of the dog, and 2 cm. of solution injected. Injection into the mandibular canal at the mental foramen is made through the gum. The foramen is situated immediately beneath the anterior root of the second premolar. At this point there is a "tied up" reflection of the mucous membrane of the lip. The foramen cannot be felt with the finger and must be searched for with the point of the needle. Having introduced the needle up the canal for a distance of one-quarter of an inch (0·7 cm.) 1 c.cm. of local anaesthetic solution is injected. When perineural injection is effectively performed anaesthesia is complete at the end of ten minutes and persists for 20 to 30 minutes.

Prior to attempting perineural injection the animal should be narcotised by morphine. Infra-orbital and mental injections are not difficult to effect, but the area desensitised is limited. Blocking of the mandibular nerve at the mandibular foramen and of the maxillary nerve in the pterygo-palatine fossa present considerable technical difficulties. There is uncertainty that the anaesthetic solution will be introduced directly around the nerve. Again, the procedures are not free from risk. The writer's conclusion is that in view of the facility with which general anaesthesia can be induced in the dog, and the great advantages

which accrue from having an animal unconscious when interfering with its mouth, uncertain procedures such as those described above have very little place in dental surgery in the dog.

The photographs illustrating this article were taken by Mr. J. E. Hancock, technician to the department of histology in the college, to whom the writer wishes to express his grateful thanks.

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HUNTERS' IMPROVEMENT AND LIGHT HORSE BREEDING SOCIETY

It was reported at the annual meeting of the Hunters' Improvement and National Light Horse Breeding Society at the Royal Agricultural Hall, Islington, that the Society was in a satisfactory position in spite of the many disturbing events of the past year.

Lord Mildmay of Flete, the retiring President, said, with regard to light horse breeding, that the council had been deeply concerned at the decision of the War Office to discontinue the grant of £4,500 on the plea, mainly, of the mechanisation of the Army. "Was it so sure," he asked, "that the day of the horse was so certainly over? Was that the opinion of some foreign Powers of great military repute with their eyes still on our supply? I am informed that we have representatives of foreign Powers at this very show. We felt it to be most desirable that the Hunters' Improvement Society should continue to have the backing of the Government, whether it came from the War Office or the Ministry of Agriculture. We repeatedly waited on both Ministers, but our efforts only resulted in a final, though sympathetic, refusal. The situation was then very dark, for we knew that the scrapping of the premium scheme for thoroughbred stallions would practically mean the cessation of light horse breeding, because farmers would be unable to pay the fees for thoroughbred stallions.

"It was then that, through the great services of Mr. Alexander Parker as intermediary, and the practical and generous sympathy of Sir Clement Hindley, chairman of the Racecourse Betting Control Board, it was intimated that the board would increase their grant to £12,000; and so our difficulties were overcome."

It was agreed to send a resolution of thanks to the Racecourse Betting Control Board.

Mr. Cecil G. Argles was elected President of the Society for the coming year, and Captain T. L. Wickham-Boynton was nominated President-elect for 1940.

The Veterinary Record

APRIL 1ST, 1939.

Dental Diseases of the Dog

IT is remarkable that, with the increasing attention being accorded by the profession to canine practice, comparatively little attention has been given to the important field of dental disease in dogs.

Canine dentistry offers great scope for clinical and laboratory research yet much of what has been done in this direction was not the outcome of a desire to study tooth formation and dental disease from a purely canine point of view. Dr. May Mellanby used dogs as an aid to the study of dental caries in children. Her authoritative publication contains much valuable information, but one appreciates the need for further study when one finds that some of the dogs used as controls did not differ from the experimental animals. Several fed on a deficiency diet should have shown defective permanent teeth, whereas their teeth were well formed, sound and healthy. In practice we have encountered abnormalities in puppies born from mothers fed on a scientifically correct diet prior to and during conception and through the suckling period. This has occurred despite the fact that the puppies were on a correct diet after weaning and showed no clinical evidence of distemper or other disease during the first six months of life. Yet their permanent teeth were obviously unsound soon after eruption. In one case neither the sire nor the dam nor any grandparent had defective teeth. Such experiences suggest that factors apparently unconnected with vitamin or mineral deficiency do play a part in tooth formation.

While caries is not an important matter in canine dentistry, dental irregularities assume particular significance in the Show dog. Many lend themselves to correction, but one must consider the attitude of the Kennel Club in this connection and get to know if the correction of dental irregularities might be held an infringement of their rules designed to prevent faking.

While there are staunch advocates of the feeding of bones as a means of preventing the potential ills of adult teeth, others, equally positive, contend that the chewing and gnawing of hard surfaces may be a predisposing factor to dental disease. They consider that the associated bruising and laceration of the gums offer

a ready entrance to infection. The freedom from dental disease so remarkable in the wild dog and the wolf has been associated with their habit of feeding. Even in times of famine they tear the flesh from the carcase and seldom, if ever, eat the bones.

It is evident that there is room for exhaustive clinical and research work on dental diseases. Their significance to the breeder and to the veterinary surgeon is of increasing importance and we welcome general and specific contribution to this subject.

CLINICAL COMMUNICATIONS

Torsion of the Uterus in the Cow, with Rectal Adhesions

N. BREAR, M.R.C.V.S.,
ULVERSTON

Subject.—Shorthorn cow in good condition, third calving.

I was called to this calving case on February 10th. Examination revealed torsion of the uterus. I estimate the degree of torsion to have been a half turn, as the hand could be introduced just far enough into the uterus to feel a limb of the foetus with the finger tips.

The cow was removed to a roomy barn and cast. It required four complete rolls to straighten out the vagina, after which the cow was allowed to get up and a breech presentation was discovered. The uterine fluids were still present ("water bag" intact) and there was now plenty of room, so that there was no serious difficulty in delivering a living calf.

At this stage in the proceedings a dog sneaked into the barn and the cow rushed furiously after it and in doing so fell over a heap of straw. Within a minute the cow began to blow and the mucous membranes became pale and it was obvious that the cow was bleeding to death. Examination of the uterus showed no signs of bleeding there and I was at a complete loss to account for this unexpected and untoward ending of the case.

Post-mortem examination revealed a torn adhesion between the body of the uterus and the rectum and including a portion of the mesentery. The adhesion had also evidently included a branch of the posterior mesenteric artery, and it was the rupturing of this which so dramatically determined the fate of the cow. I think that the adhesion was torn when the uterus fell back into its normal relative position during rolling. Chasing the dog may have hastened the cow's end but I presume that death was inevitable.

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Torsion of the Uterus with Tubal Gestation in the Bitch

N. BREAR, M.R.C.V.S.,
ULVERSTON

Subject.—Dandy Dinmont bitch, six years old, second litter. This animal was brought for examination on February 7th, with the history that she was suspected of having had an accidental mating and should be due to whelp. As, however, she showed no signs of any such activity, her owner sought my advice.

Examination showed considerable abdominal distension, but careful palpation failed to reveal anything resembling puppies. Up to this time no signs of labour had appeared and the vulva and vagina showed none of the usual preparatory symptoms. The bitch was bright and in good health and I therefore advised waiting for a few days for developments.

The bitch was brought again on February 13th, and then presented a very different picture. Her owner informed me that in the last 24 hours she had become rapidly worse, although there was still no sign of labour. She could now only stand with difficulty, was refusing all food and vomiting. Abdominal distension was now very marked. The vagina was still constricted and admitted a finger with difficulty. I destroyed the bitch and carried out a *post-mortem* examination at once.

There was a general peritonitis with copious blood-stained exudate. The body of the uterus was twisted like a rope, very congested and almost black in colour. The two cornua lay side by side and occupied the whole length of the abdomen—nothing else was visible. There was one very large and well-formed dead puppy in each. The walls of the cornua were greatly thickened and congested, and dark purple in colour. On lifting out the cornua a third foetus was disclosed. This lay transversely across the abdomen and was enclosed in a thin membrane not in any way congested. Further examination revealed this covering to be a Fallopian tube. It joined the cornu lying on the left side of the bitch at one end, and at the other end the fimbria could be clearly seen. I succeeded in taking out four full turns in the body of the uterus at which stage it "broke," due to its friability—it must, in fact, have been very near to gangrene.

I have never encountered tubal gestation in the bitch before, while, although I have seen

ABSTRACTS

[Vitamin C Deficiency and Calcium Metabolism (Ossification and Dentition). (Trans. title.) BELTRAMI, G. (1938.) *Marseille méd.* **75.** 17.]

After reviewing the literature dealing with the so-called "ostéopathies hypertrophiantes" (German: akropachie) in man and animals, the author refers to the extreme confusion existing regarding the aetiology of this condition. Various authorities have associated it with tuberculosis or other chronic infection, and with dysfunction of the endocrine metabolism. From his own observations and those recorded in the literature, Beltrami believes that the condition is primarily due to a deficiency in vitamins A and C. He states that the diet of domesticated species and of wild animals kept in captivity is especially liable to be deficient in vitamin C. In support of his thesis the author describes three cases which he believes to be "ostéopathie hypertrophiante" occurring in animals in a zoo, one in an elephant and two in lions. The characteristic finding at *post-mortem* was general hypertrophy of the limb bones which were covered with a profuse osteophytic proliferation. A study of the diets fed to the animals showed that they were deficient in vitamin C.

N. J. S.

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[Diagnosis of Pregnancy in Mares by Palpation. (Trans. title.) PETERS. (1937.) *Bekämpf. Aufzuchtkr.* 248-255.]

At 28 days the embryo is round and approximately 4·2 cm. in diameter; it is usually situated in the right horn of the uterus. At five to six weeks the enlargement is spindle-shaped, and at this stage can be palpated on the ventral wall of the uterine horn. At six to seven weeks it is the size of a goose egg, at eight to nine weeks the size of a man's fist, and at nine to ten weeks that of a man's head. During this period of development the ovary is freely movable, the uterine ligament being loose and directed downwards and backwards; in three months the uterus sinks into the abdominal cavity and the uterine ligament becomes stretched and drawn into a perpendicular position. The ovary is no longer freely movable owing to the tension on the ligament. As the foetus develops the uterine ligament is drawn forward and at five months assumes a downwards and forwards direction.

False heat occurring in the first stages of pregnancy can be distinguished from true heat by the condition of the vaginal mucosa and the cervix. After three weeks of pregnancy the vaginal mucosa is no longer moist and slimy, but becomes dry and sticky. In true heat the cervix opens sufficiently to admit two fingers, while during pregnancy it is closed and sealed by a mucous plug.

A. T. P.

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[Pasteurellosis of the Pig. (So-called Contagious Pneumonia of the Pig.) Experimental Etiological and Immunological Studies, Classification and General Pathology of the Pasteurellas. (Trans. title.) BASSET, J. (1938.) *Rev. Méd. vét.* **90.** 65-99. 4 plates. 9 graphs.]

A strain of pasteurella isolated from young pigs, which had died with acute pleuro-pneumonia, proved to be almost non-pathogenic for experimental pigs, although a strain of pasteurella isolated from an outbreak of fowl cholera was pathogenic. Basset states that the pathogenic power of strains of pasteurella isolated from different animals is not dependent on the animal of origin but upon the virulence of the culture itself. He found that it was possible to immunise pigs against lethal doses of the fowl cholera strain with pasteurellas of either porcine or avian origin. Intranasal inoculation gave better results than subcutaneous inoculation.

Basset is of the opinion that the slight antigenic variations which have been found to occur between the different pasteurellas, non-pathogenic for man, are without real significance and proposes that they should all be included in one species, *viz.*: *Past. veterinaria*. He suggests, therefore, that the genus *Pasteurella* be divided into three species, *viz.*:—

Past. veterinaria, non-pathogenic for man.
Past. pestis, responsible for plague in man and animals.
Past. tularensis, responsible for tularaemia in man and animals.

The article concludes with some observations on *B. pseudo-tuberculosis* which has several analogies with the pasteurellas.

J. S. P.

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[Trichomonas foetus in Bulls. ANDREWS, J., and MILLER, F. W. (1938.) *Amer. J. Hyg.* **28.** 1. 40-50.]

The usual procedure adopted by the writers for the diagnosis of *Trichomonas* infection in bulls was to obtain seminal fluid and spermatozoa separately by intra-rectal massage. The technique is as follows: About 25 c.c. of sterile saline containing 0·5 c.c. of defibrinated rabbit

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torsion of one horn of the uterus in the bitch. I have never previously seen torsion of the body. Both these rare conditions occurring together make this case unique in my experience.

blood was injected into the sheath and as much of the fluid was recovered as was possible by milking the sheath with the hand. A portion of this material was immediately examined microscopically and the rest of it poured on a whole egg slant for cultural purposes. The seminal vesicles of the bull were then massaged and the seminal fluid collected in a clean tube. A portion of this was examined microscopically and the remainder poured into an egg slant culture tube to which sterile saline enriched with blood was added. The ampullae ducti deferentes were then massaged and the sperm-containing fluid was collected and examined as above. Confusion in diagnosis caused by moving spermatozoa may be avoided by dilution with saline or letting the material stand at room temperature for a few hours, when the spermatozoa will have lost their motility. *Trichomonas* was found more frequently in semen and sperm than sheath washings, but on *post-mortem* examination the organisms were found only on the prepuce and glans penis.

The percentage of positive diagnoses was greatly increased after repeated examinations on account of the small number of the organisms present in the chronic stage of the disease. Microscopic examination gave more positive results than cultivation and the combined results exceeded those of either method separately.

These examinations revealed as positive approximately 50 per cent. of the bulls which were shown by the combination of this information, *post-mortem* findings and epidemiological observations to harbour trichomonads.

The duration of infection was shown in one case to be up to eleven months in a bull that was not being used for service, and it is suggested that the only method of control of trichomoniasis in bulls is by preventive measures.

It is recommended that clean bulls be bred only to unexposed heifers and cows by natural service, and exposed females be bred either to infected bulls naturally or to clean bulls by artificial insemination.

J. S. S.

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[Bacterial Types in Swine Tuberculosis in Sweden. Lilleengen, K. (1939.) *Skand. Vet.-tidskr.* **29.** 1. 1-2. (English summary.)]

Of 128 cases investigated from various parts of the country it has been possible to determine the type in 120. Of these, 107 were bovine, nine were avian, one was a mixed bovine and avian, and three were human. Typing was carried out using Löwenstein's medium and experimental inoculation of guinea-pigs, rabbits and fowls.

E. G. W.

[Experimental Studies on Infectious Abortion in Mares. Susceptibility of Geldings to Infection with Salmonella Abortivo-Equina. (Trans. title.) Hirato, K., Soekawa, M., and Miura, S. (1937.) *J. Jap. Soc. Vet. Sci.* **16.** 4. 59-62.]

The authors are of the opinion as a result of their experiments that geldings have a high degree of resistance to infection with *S. abortivo-equina*, and the organism, in their view, is probably incapable of producing a true infection in these animals.

Following inoculation the symptoms associated with fever were observed and a slight anaemia and jaundice produced. In the anaemic subject the erythrocyte sedimentation rate and the number of erythrocytes returned to normal with recovery but a leucocytosis persisted for some days. This latter feature of the blood picture varied somewhat, depending on the method of inoculation.

By cultural methods it was possible to recover the bacilli from the urine of one gelding; faecal cultivation, however, gave negative results. It is of interest to state here that there seemed to be no difficulty in detecting the organism in the faeces of perorally inoculated pregnant mares.

Specific agglutinins could be demonstrated on the fourth day following inoculation and their maximum production was reached a week later. The method of inoculation affected the quantity of H agglutinin, which could be detected in larger amounts after the subcutaneous method.

The distribution of the bacilli in the system of inoculated animals was studied. They were found chiefly in the lymphatic glands and recovered once from each of the following organs: pancreas, kidney, thyroid and parathyroid. It was difficult and often impossible to recover the organism from the tissues one month after inoculation. In one case, however, a positive culture (of the submaxillary gland) resulted 47 days later.

Histological examination revealed a slight reaction against infection by the reticulo-endothelial system.

P. E. M.

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Errata. (1) "Osteofibrosis in Equines. (*V.R.* **51.** 10. 319.) At the end of second paragraph, *for* "[CaO : P_2O_5 = 18·1 : 1] remained in good health," *read* "[CaO : P_2O_5 = 1·8 : 1]. . ." (2) "A Discussion of Food and Contact Allergies." (*V.R.* **51.** 12. 386, line six should read "year after year in the *same* animals."

The 55th annual National Hackney Show, to be held at Portsmouth on June 1st, 2nd and 3rd next in conjunction with the Royal Counties Society, caters for harness horses of all heights and ages, in addition to hackneys and ponies in hand. An innovation is the inclusion of classes for riding horses and ponies.

REVIEWS

[Horse Owners' Reference Book (1939). Published by the National Horse Association of Great Britain, 12, Hanover Square, London, W.1. Price 1s. net, 1s. 2d. post free.]

The increased size of this year's edition of a publication which has proved invaluable to horse-owners as a source of information reflects the ever-increasing interest taken in horses and horse riding: the book now contains 180 pages. In addition to some 500 to 600 dates of fixtures in which horses and ponies can participate this year—*e.g.*, horse shows, gymkhanas, races, point-to-points, sales, etc.—the book contains a classified list of riding schools in all parts of the country, intimating the facilities available at each school, and with the Association's approved riding schools specially indicated.

Sixteen pages are devoted to statistical tables in which are included all available records and figures relating to the horse, and there are full details of the horse and pony societies. The publication further includes addresses of sporting and agricultural papers and information concerning matters of interest so diverse as packs of hounds, railway rates, etc.—an indication that the book is as comprehensive as its title suggests.

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["Veterinary Digest." Ontario Veterinary College, Guelph, Canada. Single copy, 35c.; per year $1.50.]

We have received the first three issues of *Veterinary Digest*, published monthly by the students of the Ontario Veterinary College, "in the interests of graduates and under-graduates" of that foundation. This journal bears little resemblance to the "students' magazine"; in accordance with its expressed ambition, it should appeal to the graduates of all colleges as a useful addition to the periodical literature of the profession. Well produced, on good paper, it contains full summaries of carefully selected articles, calculated to appeal to the practitioner, from American, English, and Australian sources, together with a number of original articles and case reports by veterinarians. At the same time, the collegiate interests of the students and *alumni* are catered for capably.

The Livestock Commission announce that, in consultation with the Ministry of Agriculture and Fisheries and the Livestock Advisory Committee, they have prepared a leaflet setting out the desirable features to be borne in mind in connection with the provision of accommodation for the sale of attested stock in livestock markets.

Copies of the leaflet (Livestock Commission Leaflet No. 3) may be obtained free of charge from the Secretary, Livestock Commission, 1, Sanctuary Buildings, Great Smith Street, London, S.W.1.

N.V.M.A. DIVISIONAL REPORT

North Midland V.M.A.*

ANNUAL MEETING AT SHEFFIELD

The Annual General Meeting of the North Midland Division was held at the King's Head Hotel, Change Alley, Sheffield, on February 28th, 1939.

The President, Mr. E. Marrison, occupied the Chair and the following members were present: Messrs. W. Collinson, T. C. Fletcher, R. E. Hirtes, S. H. Nixon, F. C. Scott, and H. Thompson. Mr. D. W. Caldwell attended as a visitor.

The minutes of the last meeting were taken as read.

Apologies for absence were received from Mr. G. J. Furness, who also tendered his resignation owing to his retirement from practice, and from Mr. P. M. Evershed.

The Treasurer submitted his statement of income and expenditure for 1938. This was found correct by the Auditors and accepted.

Messrs. D. W. Caldwell and D. L. Thomson, who were nominated at the last meeting, were elected members of the Division.

Election of Office-Bearers

The following officers were elected:—
President.—Mr. E. Marrison.
Vice-Presidents.—Messrs. Collinson and Nixon.
Hon. Treasurer.—Mr. H. Thompson.
Hon. Secretary.—Mr. R. E. Hirtes.
Auditors.—Messrs. Fletcher and Scott.

Consideration was given to the letter received from the N.V.M.A. *re* election of Delegates to the Council. The President and Hon. Secretary were appointed.

The resignation of Mr. Furness was accepted with regret and the Secretary was instructed to give a cordial invitation to Mr. Hamilton, who has taken over the practice, to join the Division.

A letter was read from the N.V.M.A. with regard to a broadcast from the regional programme and the Secretary was instructed to write to the B.B.C. in support of the letter from the "National."

Protests were lodged with regard to articles published in the *Daily Mirror* on the diagnosis and treatment of dog ailments, and the Secretary was instructed to bring the matter to the notice of the N.V.M.A.

The case of an unqualified practitioner was again considered and the Secretary was instructed to write to the Secretary of the

(*Concluded at foot of column* 1, *page* 426)

*Received for publication March 21st, 1939.

SOME CONTEMPORARY CONTRIBUTIONS TO OUR KNOWLEDGE OF ANIMAL HUSBANDRY

(*Continued from page* 182)

Cod-Liver Oil as an Animal Feeding Stuff

From an article in the March issue of the *Journal of the Ministry of Agriculture** we reproduce the following abbreviated account, which should be of interest to veterinarians, of the production of cod-liver oil and its uses as an animal feeding stuff.

Production.—There has recently been a complete revolution in production methods. Fish livers are extremely perishable and in the past only inferior oil could be produced from livers preserved by ice storage or refrigeration methods. The solution of this difficulty has been found in "rendering" the oils from the livers by a steaming process carried out in the trawlers at sea, and subsequent storage of the oil in clean, cool containers on board ship until the vessels return to port. The steaming process is effective in destroying the marked decomposing tendencies of the fish liver. On shore, purification by washing, subsequent treatment either in centrifugal separators or under high vacuum are the normal processes, followed by cold cleaning for oil intended for medicinal purposes.

The change in production methods has resulted in a product which is an attractive food oil without any objectionable flavour or smell. At the same time, this change has resulted in a spectacular rise in production from approximately 7,000 to 16,000 tons per annum, so that British cod-liver oil is now one of the few home-produced foodstuffs which this country exports in substantial amounts.

Vitamin Values.—Special attention should be given to the vitamin values of cod-liver oil. These were defined in the *British Pharmacopoeia* for the first time in 1936, as not less than 600 units of vitamin A activity, and not less than 85 units of antirachitic activity (vitamin D) in 1 grm. The figure of 600 International Units of vitamin A is low for average cod-liver oil, but that of 85 units of vitamin D per grm. is higher than many undoubtedly genuine cod-liver oils can show. The point to stress is that even at the minimum values which genuine cod-liver oil can show, it will always do its work medicinally or as a food oil when used in the quantities and proportions usually fed or prescribed. A desirable minimum standard would be 500 units vitamin A and 50 units vitamin D per grm.

The vitamin values of cod-liver oils, and, indeed, of all liver oils, vary within wide limits. For genuine cod-liver oil, extreme figures on upwards of 30,000 tons of oil examined in batches of from 50 to 250 tons are from 5,000 to 500 units of vitamin A and from 500 to 50 units of vitamin D per grm.

Adulteration.—Cod-liver oil has, by virtue of its outstanding nutritive values, always commanded market prices higher than most other fish oils. It is also an oil in which adulteration is somewhat difficult to detect and prove. The usual forms of adulteration are:—

(1) Admixture with other fish or marine oils superficially resembling cod-liver oil.

(2) The addition of vitamins A and D from other sources.

Either type of adulteration is somewhat difficult and expensive but by no means impossible of detection, but when both types of adulteration, skilfully done, occur at the same time, the puzzle set for the chemist or biologist may be all but impossible of solution.

Adulterated cod-liver oil can be very disastrous in practice and can at best only lead to exaggerated estimates of the amount of oil or vitamins it is necessary to use in feeding practice.

Fortunately, in British farming, adulterated cod-liver oil can be easily and certainly avoided. Production is centred at very few ports, and reliable oil sealed at its source and of guaranteed purity, quality and vitamin values can readily be obtained from the primary producers, most of whom are themselves in a position to obtain or carry out adequate biological tests. This is by far the best precaution to observe in buying, but it is always well to obtain a specific invoice or other guarantee to the effect that the oil is "guaranteed to be pure cod-liver oil from which no constituent has been removed and to which nothing has been added." Such a specific guarantee coupled with the evidence of general quality which the farmer's own nose and palate can give him is really all that is necessary in buying cod-liver oil for his livestock.

Stability.—Cod-liver oil is not entirely stable either in its character as an oil or in its vitamin values. Care in handling and use is therefore necessary. The main thing to be guarded against is the oxidation changes which can readily take place when the oil is exposed freely to air. In closed and sealed containers, cod-liver oil retains its food quality and vitamin values intact almost indefinitely, but once containers have been opened and especially if there is free access of air there is danger of deterioration. Even then, however, deterioration is not rapid, especially if the oil in the first instance has been of good undamaged quality. It is a good rule to buy oil in new sealed containers and in such amounts that the contents are used up within a reasonable period of the date of opening. Should this not be possible, the contents of large containers should be transferred to clean small ones and be sealed up to await use.

The greatest danger from oxidation changes arises after the oil has been mixed with feeding meals and stored for prolonged periods. Unfortunately, no definite period of safety can be given under this heading since so much of the stability of the mixture depends on the

*"British Cod-Liver Oil: Its Production, Properties and Uses as a Feeding Stuff," by K. MacLennan (1934). *J. Min. Agric.* 45. 1245-1254.

Royal College and the Divisional Representative on the Council, Mr. Procter, with reference to this case, asking that action be taken by the Royal College.

The President, on behalf of all the members present, offered the Division's congratulations to Mr. Caldwell on his recent marriage.

It was decided to hold the next meeting of the Division on May 30th, 1939.

An open discussion followed and, as there was no other business, the meeting closed with a vote of thanks to the President.

R. E. Hirtes, *Hon. Secretary.*

quality of the oil itself, the quality of the meals and the method of incorporation employed. Damaged oils themselves go off more quickly but even more important is the quality of the meals. Meals which are in any way old or musty are particularly destructive to the added oil—a further reason, if any were needed, why such meals should be rigidly avoided for feeding purposes.

The method of incorporation is also of importance, and probably the best method and the one followed by the most reliable feed manufacturers is to mix and steam the meal gently to begin with so as to break up any loosely bound oxygen complexes in it. Such procedure also improves the general feeding quality of the meal. Admixture of the oil may then be carried out practically in an atmosphere of steam and at such temperatures as will ensure penetration of the oil into the particles of the meal and some consequent protection from the air.

Taking all circumstances into account, the method of choice in feeding should be for the farmer to use and mix the oil on the farm for immediate consumption. In this way he can be sure of the full feeding value of oil and vitamins, and avoid all deterioration.

Use as a Feeding Stuff.—Cod-liver oil is the only fat used as such in the feeding of animals. Its value in feeding arises out of this and out of the fact that it is outstandingly rich in the two fat-soluble vitamins A and D. The complete food value of the known constituents of cod-liver oil in terms of its starch equivalent and vitamin A and D values may be assessed at £63 per ton. Reliable oil can usually be purchased at prices very much below this figure and, used with discretion, it is a good value-for-money feed.

Methods of Use.—Despite its high food and vitamin value per ton, cod-liver oil is an expensive foodstuff and its use should be systematically and carefully restricted to those classes of livestock and sets of conditions where an economic return can be confidently looked for. These, generally, are:—

(1) For pregnant and lactating animals.
(2) For young, rapidly growing livestock.
(3) For stock kept intensively and fed a diet predominantly of concentrated starch-rich foods.
(4) As a supplementary winter-time food.

Obviously, most of the above conditions apply to either or both poultry and pig keeping, and particularly to young and breeding stock. They also apply to calf rearing when this is done artificially. For other classes of livestock, cows, horses and sheep, cod-liver oil should be regarded as something to be used in pregnancy, lactation and youth in winter-time or when pastures are scorched and bare. In these circumstances, cod-liver oil can make good in great measure the difference in feeding value between the rich young grass of spring and early summer and the predominantly vitamin-poor, even vitamin-free, foods of winter or hand feeding.

Taking the ordinary classes of farm livestock in greater detail, the following are general recommendations:—

Poultry.—Even the best mixtures of ordinary farm foods, made up from cereals, milling offals, fish meal, meat meal, yeast and mineral supplements, contain insufficient vitamin A and D values to keep birds in health and heavy production under intensive conditions as sufficient sunlight is not always available, and a further supplement, such as cod-liver oil, is therefore desirable. Nothing but disaster results with intensively kept day-old chicks if such a supplement is omitted. The whole tendency of modern poultry-keeping has been to push the breeding and egg-laying season back from spring and early summer to winter and early spring. In view of this it is practically impossible for the birds to obtain even from natural surroundings all the vitamin A and D values that are now known to be essential for growth and for heavy egg production. Cod-liver oil presents an easy way of overcoming this difficulty.

For classes of poultry other than hens, and particularly for day-old turkeys and ducks, there is even greater need for cod-liver oil. Symptoms of deficiency which require some five to six weeks to develop with chicks fed on ordinary mixtures of farm foods without cod-liver oil develop, under the same conditions, with day-old ducks and turkeys within two or three weeks.

For average conditions the amount of reliable cod-liver oil necessary for poultry is one pint per cwt. of food fed, including both mash and grain. It can be mixed with either the mash or the grain or both, and should preferably be fed as soon after mixing as possible.

Pigs.—The food fed to pigs is essentially of the same nature as the food fed to poultry; that is, predominantly rich in starchy matter and predominantly poor in good-quality fat and the fat-soluble vitamins A and D.

Further than this, pig-keeping is tending to follow the same sort of intensive lines as poultry-keeping and the same type of nutritional failures are liable to occur (see *J. Min. Agric.*, December, 1938).

For pigs, the best results with cod-liver oil will be got from the breeding, suckling and weaning animals. Breeding failures, particularly in the winter-time, are often due to failure to use cod-liver oil in the food, and the same cause often accounts for failure in lactation and for lack of vigour and vitality in the weaned pigs.

The amount of one pint per cwt. of food fed is satisfactory for breeding, young, and weaning stock. Its use for pigs that have been firmly established after weaning requires greater caution and should not be necessary if the oil has been given systematically through pregnancy and lactation. Store pigs whose vitality has been built up satisfactorily can usually stand up to the necessary fattening period on the strictest quality feeds from a bacon production point of view. The use of large quantities of poor quality cod-liver oil during the fattening period should be avoided as there is otherwise a distinct danger of undesirable taint or rancidity arising in the cured bacon.

Horses.—Horses, like pigs and poultry, are not suited by the nature of their digestive mechanism to obtain sufficient nourishment from grass to meet all their needs for long periods of work or training. Hence, they must be "put out to grass" more or less frequently, depending on the manner of feeding, to make good the constitutional impairment that invariably arises from the ordinary mixtures of hand-fed food. With working horses the periods over which they can be kept in hard work without being turned out to grass can be very much increased by the systematic use of cod-liver oil with stall-fed rations. The same is also true for horses in training.

There is also considerable evidence to show that the difficulties which arise in breeding of bloodstock, pedigree horses, and with working animals under town conditions, arise from failure to give sufficient attention to adequate supplies of vitamins A and D in the food fed. Deficiency of this kind can most easily and economically be made good by the systematic use of cod-liver oil.

An amount of cod-liver oil equivalent to one pint per cwt. of food is again suitable for horses. If the hay fed is of really good quality this amount may be calculated on the amount of grain and concentrates fed. It may be given mixed with the food in the ordinary way or, alternatively, the old custom of giving a special bran mash containing the necessary amount of oil may be given once or twice a week. This is of particular importance for brood mares where difficulties have arisen in breeding, and in the health and vitality of foals.

Cattle.—The outstanding difference between cattle and the other classes of livestock already considered is that they, like sheep and goats, are herbivorous animals with a complex digestive system intended by nature to deal satisfactorily, for the needs of the animals, with large quantities of grass. An outstanding difference between grass, the natural food of herbivorous animals, and the food which these animals are normally offered, is the abundant vitamin value, particularly vitamin A, which grass supplies as compared with the normal indoor hand-fed food. Milk cows require much larger supplies of vitamin A for their wellbeing and for the production of milk of satisfactory quality than are contained in the ordinary foods fed indoors. In many instances, indeed, it can be said that this food is almost entirely devoid of vitamin A value. It is well known that milk cows will denude their own bodies to provide milk of reasonable quality; as much as one-half of their bone substance can be sacrificed for this purpose, and the same is apparently true of their reserves of vitamin A. Such deprivation contributes substantially to the high rate of wastage which characterises our dairy herds and to the failure to breed successfully and to produce healthy, vigorous calves, which is another and very disturbing feature of intensive milk production. Another point is that with dairy cows, as with poultry, there is, for a variety of commercial reasons, a strong motive to concentrate the high production period in the winter months when the foods available are predominantly poor in vitamin values. The poor vitamin quality of winter milk reflects the winter vitamin poverty of the food fed.

For calves and young growing stock, particularly when these are kept indoors and hand-reared, there is every reason to supplement the skim milk and ordinary mixtures of food with cod-liver oil; in fact, the condition of calves and store cattle during their first or even second winter is often eloquent of vitamin starvation during the winter months, and the spectacular improvement which can take place when such animals are turned out to good, luscious spring grass is equally eloquent testimony to what can be, with confidence, attributed in great measure to the making good of this vitamin deficiency.

The quantity of one pint per cwt. of concentrate food consumed is suitable both for mature and young stock. With cows, care is necessary in introducing the oil into the food, and it is specially important that cod-liver oil of poor quality, repellent in taste and smell, should be avoided; otherwise, digestive disturbances may arise and there may be interference with milk and milk-fat secretion. Such results have been observed in practice when excessive amounts (up to six pints per cwt.) of questionable cod-liver oil have been used. On the other hand, there is evidence to the effect that when good quality oil is used in reasonable proportions (up to one pint per cwt. of food) the effect on the health of the animal, on its milk and milk-fat secretion, and on the vitamin value of the milk is beneficial.

For hand-reared calves, the amount of cod-liver oil necessary to supplement skim milk and give a reasonable amount of fat as well as the necessary vitamin values is about two ounces per gallon of skim milk. Good quality cod-liver oil only should be used and it should be mixed or emulsified as thoroughly as possible with the milk before feeding. When dry feeding is introduced, the normal allowance of one pint of cod-liver oil per cwt. of feed is satisfactory.

Sheep.—Much attention has been given to the mineral deficiencies of sheep pastures in this country and elsewhere, and it is known that mineral deficiencies can have disastrous effects on the wellbeing, and particularly the breeding capacity and general health, of flocks. Apparently little attention and study has, however, yet been given to the question of vitamin deficiencies, though it is known that vitamin deficiency itself, especially vitamin D deficiency, can lead to insufficient use of such mineral supplies as may be available. All that can be said on this subject meantime is that many of the symptoms that are prevalent in our flocks, particularly parasitic infestations and failure to produce vigorous lambs, suggest vitamin deficiencies of the type that could be made good by the systematic use of cod-liver oil, particularly when pastures are bare, when flocks are on limited range and where hand-feeding has to be resorted to.

The amount of one pint per cwt. already recommended for other classes of livestock is satisfactory for sheep as an addition to the hand-feed given to breeding flocks, ewe lambs intended for breeding purposes, and to young lambs.

Cod-Liver Oil as a Medicine.—It is the feeding value and normal use of cod-liver oil as a feeding stuff that has already been stressed. It is much better to use the oil systematically as a food than to use it in emergency as a medicine. Where symptoms of deficiency are actually apparent the amount of cod-liver oil used can be increased from two to four times the standard allowance of one pint per cwt. of food.

In many instances cod-liver oil can be given in substantial quantities from a few ounces to upwards of a pint in one dose, when, in addition to its curative action, it will also act as a mild purge or laxative.

Chillingham wild cattle are to be preserved, thanks to the success of the appeal for funds to form an association to safeguard their interests, to which we made reference in a recent issue. Lord Tankerville recently announced that he was unable at his own expense to maintain the herd, which has lived in a wild state for hundreds of years at Chillingham.

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Almost an unknown disease on the island, swine fever has been detected on a farm in the North of Jersey. An order for the immediate slaughter of the animals was issued.

In Parliament

Tuberculosis in Wales

In the House of Commons on March 22nd, on the motion for the second reading of the Consolidated Fund (No. 1) Bill, Mr. J. Griffiths raised the question of the report of the Committee of Inquiry into the anti-tuberculosis service in Wales. He expressed the gratitude of members in all quarters of the House to the members of the inquiry for their valuable report. That report had shocked the nation. It revealed a terrible picture and presented a terrible problem which must be solved whatever might be the effort or the expense required.

The report revealed Wales as an impoverished nation. There were revelations of malnutrition, bad housing, poor schools, and inadequate social services. All of these were by-products of poverty and of that ignorance, inertia, and fatalism which poverty bred, plus that subordination of public welfare to selfish interests which was the final condemnation of the economic system under which we now lived. For eleven years a quarter of the population of Wales had been living on the dole. The report presented a terrible picture of the toll which the white scourge was taking in Wales. One lesson of the report was that this was a man-made disease, and that what man had made he could cure. This was not a decree of fate but a social problem capable of solution.

After debate, Mr. Elliot, Minister of Health, in the course of his reply, said that Welsh members had rightly taken the opportunity to debate upon the conditions in Wales. It was not a party matter. There was a challenge to the local authorities, who would have to examine and improve the situation by administration or other measures, and there was a challenge to the national spirit, which was accepted by all. These problems existed also in Scotland and England. The report on rural housing in Scotland attracted widespread attention, and conditions in rural England were in many ways unsatisfactory.

What had been particularly brought home to the House was the poverty of the rural areas, what might be called the poverty of the peasant. He was glad to see that in the report the efficiency of the work of the Edward VII Welsh National Memorial Association was appreciated, and he paid tribute to the work of Lord Davies. Emphasis had been laid on the fact that treatment was only one aspect of tuberculosis work. The offensive against tuberculosis, and indeed against disease in general, covered a much wider field than merely remedial or medical measures.

He intended to visit rural Wales, and felt that a great deal was to be done by the contact of the Minister with the administrative machine. He had asked for the observations of the Welsh Board of Health on the report, and also for the observations of the local authorities. There was a reply to some of the criticisms, and the authorities should have the opportunity of making their observations known. He hoped later to hold a conference in Wales with the local authorities.

In regard to the purity of milk, the number of attested herds in Wales was steadily increasing. The number had grown from 454 herds, comprising 13,000 animals, in February, 1938, to 1,460 herds, comprising 38,000 animals, in August, 1938. Nearly 2,000 additional herds were being tested with a view to qualifying for certification. That showed that the great basic industry of agriculture was making progress, and that the supply of pure milk was becoming increasingly adequate. There was now a veterinary service in Wales with inspectors paid by the State.

Sir Francis Fremantle: Does my right hon. Friend say that attested milk is really free from tubercle bacilli?

Mr. Elliot: Yes, certainly. The Attested Herds Scheme is intended to eradicate bovine tuberculosis, and the conditions of attestation include very stringent rules in order to maintain the herd in a state of freedom from bovine disease. I am not talking of accredited milk. That is a very remarkable achievement, especially considering the low economic level, to which the report also draws attention, of many farms.

Mr. Richards: Before the Minister leaves that subject, would he say something on the very serious question, which was raised by my hon. Friend the Member for Llanelly, of the scarcity of milk in rural Wales, and the difficulty of getting it? I quite recognise what the right hon. Gentleman has said about the improvement that has taken place, but the fact is that there is no milk, good, bad or indifferent, to be had in some parts of Wales.

Mr. Elliot: I have not nearly left that subject yet. Milk is a matter that is very dear to my own heart, and I am glad to have the opportunity of saying something about it. Indeed, it is of great importance that the purity of the milk supply should be stressed, and that any impression that Wales is riddled in every direction with tuberculosis should be carefully avoided.

The report speaks of the routine inspection of cattle, and the necessity for the taking of more vigorous steps to eliminate infected cattle; and it draws attention to a letter by Professor Picken in which he points out that certain counties—Glamorgan, Flint, Denbigh and Monmouth—are at the head of the list for slaughtering cattle under the Tuberculosis Order, while certain other counties, namely, Pembroke, Carnarvon, Brecknock and Radnor, are at the bottom of the list, and rather draws the conclusion that that seems to be due to laxity on the part of the authorities which are at the bottom of the list as against the greater keenness of those at the top. That, I think, is not exactly true, because, if one looks into the matter, one finds that the counties I have just mentioned, where the rate of slaughter is low, are just those counties where the largest numbers of self-contained herds are, and where enormous efforts have been made to clear the herds from tuberculosis infection, whereas the counties where the rate of slaughter is high are counties in which the herds are largely maintained on a "flying" basis with outside stock. It is one of the figures that ought to be taken into account when we are trying to examine this very important and interesting report to see whether we can explain any of the figures. I think the counties which have done so much to clear up their herds should not be branded as inefficient because they have not so much tuberculosis as to necessitate immediate slaughter.

On the purity of milk supplies, the report also draws attention to the coming into force of legislation for a State veterinary service. That will be of interest because it deals with two points made to-night, namely, the lack of power for local authorities to carry out these works,

because of the lowness of their resources, and the necessity of bringing in people from outside who should do this work. These things have been planned. The State veterinary service has, in fact, been brought into operation. It has saved Wales something like £11,000 a year, and is now providing a service of which the total cost is something like £31,000. That is a very great advance. Before the State veterinary service came into operation, on April 1st, 1938, there were only six full-time veterinary inspectors in all Wales, and now we are able to say that the whole-time staff of veterinary inspectors in Wales and Monmouth consists of two superintendent inspectors, 13 divisional inspectors and 26 veterinary inspectors. Each county in Wales constitutes a division which is in the charge of a veterinary inspector, and all are paid entirely by the State. The House will be glad to have those figures, and to learn of the setting up of this service, because it is so much in line with the recommendations made in some of the speeches this evening.

The milk supplied to the schools has to be provided under the authority of the county medical officer. It has to be tuberculin tested or the best milk available. I can say that every single herd from which milk is bought for the milk-in-schools scheme is inspected four times a year, and in addition a considerable proportion of this milk comes from tuberculin-tested herds.

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The following questions and answers have been recorded in the House of Commons recently:—

Horses and Mules

Major Braithwaite asked the Secretary of State for War whether he will state the percentage of horses and mules belonging to the Army which were destroyed for veterinary reasons, admitted for treatment of injuries of all kinds, and admitted for treatment of ailments other than injuries during the years 1936, 1937 and 1938, respectively?

Mr. Hore-Belisha: The following table gives the percentages at home for the last three complete financial years:—

Financial Year.	Destroyed for veterinary reasons.		Admissions for treatment of injuries.		Admissions for treatment of ailments other than injuries.	
	Horses.	Mules.	Horses.	Mules.	Horses.	Mules.
1935-36	3·88 ...	4·76	43·46 ...	18·57	49·42 ...	14·29
1936-37	4·96 ...	Nil	44·95 ...	21·53	37·06 ...	21·43
1937-38	5·65 ...	Nil	47·47 ...	Nil	30·67 ...	Nil

COLONIAL STUDENTS IN ENGLAND

The Stationery Office has published the report of the Colonial Student's Committee, which was appointed by the Secretary of State for the Colonies in August, 1937, to consider what extension or modification of the existing arrangements for the supervision and guidance of students from the Colonial dependencies was desirable and practicable. The recommendations made have been accepted in principle by the Secretary of State and commended by him to Colonial Governments.

The committee found that practically all the difficulties in which students from the Colonial dependencies found themselves were due to the tendency of many of them to come to this country totally or partially unequipped with the necessary qualifications, introductions to universities, etc., financial provision, information about conditions in this country, or preliminary medical examination. It was a matter of great importance, not only on grounds of humanity but also on grounds of broad Empire policy, that no effort should be spared to promote the well-being and success of Colonial students in this country.

The report recommends that some authoritative local organisation, official or unofficial, should be established in each dependency to which the intending student or his parents could go for information and advice. There should be also widespread publicity in the Press, in the schools, and from the broadcasting stations, aimed at educating the public to such an extent as to ensure for the local organisation co-operation on the part of parents and intending students.

On arrival in this country the student, assuming he had already secured entry to a particular course of study, was still in need of such services as meeting on arrival, assistance in finding lodgings, arrangement of hospitality and social contacts, general help and guidance, and perhaps guardianship. The Victoria League performed all these functions for students from Malaya and Hong-Kong on its lists and had started to perform similar functions for Africans and West Indians and arranged invitations to social entertainments for students from any part of the Empire. It was a voluntary organisation, Empire-wide in its scope, without restriction of race or colour, and had acquired valuable experience in the performance of all the functions required to be exercised on behalf of students in this country.

It was proposed to vest in the Victoria League the primary responsibility for co-ordinating all the available services, and ensuring, by publicity, that students placed themselves in touch with the league on arrival. The league should be charged, however, with achieving the fullest co-operation with other organisations in the field so that the interests of those organisations would not be impaired but strengthened, for it would be unfortunate if centralisation under the league were to result in discouragement of the valuable activities of other bodies.

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On March 23rd the Duke of Windsor received in Paris Mr. E. Bridges-Webb, general secretary of the People's Dispensary for Sick Animals of the Poor, who informed him of the recent arrangement between the Royal College of Veterinary Surgeons and the Society for giving a more widespread service for the sick animals of the poor. The Duke of Windsor was patron of the P.D.S.A. in 1923.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

April 1st.—Annual Fees due to R.C.V.S.
April 3rd.—N.V.M.A. Committee Meetings at 36, Gordon Square, W.C.1.
April 4th.—N.V.M.A. Committee Meetings at 36, Gordon Square, and **Council** Meeting at the Connaught Rooms, Great Queen Street, Kingsway, W.C.
April 6th.—Meeting of the Central Division, N.V.M.A., at the Conway Hall, W.C.1, 6.30 p.m.
April 12th.—R.C.V.S. Committee Meetings.
April 13th.—R.C.V.S. Committee Meetings.
April 14th.—R.C.V.S. Committee and Council Meetings.
April 14th.—Meeting of the Derbyshire Division, N.V.M.A., at Mickleover, near Derby, 2 p.m.
April 17th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.
April 21st.—Meeting of the Sussex Division, N.V.M.A., at Brighton, 2.45 p.m.
April 21st.—Meeting of the Mid-West Division, N.V.M.A., at Bath, 2.30 p.m.
May 4th.—R.C.V.S. Council Election. Last day for nominations.
May 8th.—Animal Management Examination begins.
May 15th.—Rome Congress on Comparative Pathology begins.
May 18th.—R.C.V.S. Council Election Voting Papers issued.
May 25th.—R.C.V.S. Council Election Voting Papers due.
June 1st.—**Annual General Meeting, R.C.V.S.**
June 8th.—D.V.S.M. Examination begins.
June 20th.—R.C.V.S. Committee Meetings.
June 21st.—R.C.V.S. Committee Meetings.
June 21st.—**R.C.V.S. Annual Dinner.**
June 22nd.—R.C.V.S. Committee Meetings.
June 23rd.—R.C.V.S. Committee and **Council** Meetings.

July 23rd—28th.—N.V.M.A. Congress at Great Yarmouth and Gorleston-on-Sea.

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R.C.V.S. COUNCIL ELECTION

A further nomination has been received, namely, that of Mr. George Newman Gould, of Southampton, who is proposed by Mr. J. F. D. Tutt and Mr. K. G. Morgan. There are now 15 candidates for the eight vacancies on the Council.

PERSONAL

The Late Mr. R. Craig Robinson

A reference to the services of the late Mr. R. Craig Robinson as veterinary inspector to the Corporation for over 40 years was made by Mr. T. Ridley, chairman of the Health Committee, at a recent meeting of the Carlisle City Council. In their report to the Council the committee recorded their deep regret at his death and expressed sincere sympathy with his widow and family.

Mr. Ridley said that Mr. Robinson took a pride in holding that position, and was justly proud of the horses under his care. In the last few years there had been, of course, a considerable increase in motor transport for Corporation purposes, but they still had some of the best horses in the city, which were well looked after at their own stables.

Mr. W. G. Robinson, B.Sc., M.R.C.V.S., has been appointed part-time veterinary officer to the Corporation.

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R.C.V.S. OBITUARY

Buxton, James, Ivy Cottage, Northchapel, Petworth. Graduated Edinburgh, April 26th, 1886. Died March 25th, 1939; aged 80 years.

Cocksedge, Thomas Abraham Bryan, The Spinney, Amersham, Bucks. Major late R.A.V.C. (T.F.) Graduated December 23rd, 1909. Died March 2nd, 1939.

Robertson, James Ambrose Renwick, 7, Linden Avenue, Kidderminster. Graduated Edinburgh, April 28th, 1926. Died March 20th, 1939; aged 34 years.

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Mr. J. A. R. Robertson, M.R.C.V.S., D.V.S.M. (Vict.)

In connection with the death at Kidderminster of Mr. J. A. R. Robertson, which we record above with deep regret, a colleague writes: "The death on March 20th of J. A. R. Robertson at the early age of 34 has come as a very great shock to his many friends. The only son of Captain and Mrs. James Robertson, of Stourbridge, he was born at Upton-on-Severn, Worcs., and educated at King's Lynn Grammar School and King Edward's School, Birmingham. He studied at the Royal (Dick) Veterinary College, Edinburgh, receiving his Diploma of Membership on April 28th, 1926, having passed his final examination before he was 21 years of age. The following year he received the Diploma in Veterinary State Medicine from Victoria University, Manchester.

"In 1927 and again in 1928 he visited South America at the instigation of Lieut.-Col. T. Dunlop Young to carry out meat inspection duties in connection with caseous lymphadenitis in sheep, and in this connection he did valuable work. As a result of his reports, considerable changes occurred regarding the importation of sheep carcases from South America. On his return, he joined his father in practice in Stourbridge. Later, he established a branch practice in Bridgnorth and finally settled down in Kidderminster, where he rapidly built up a first-class practice.

"Of a quiet and reserved nature, Ambrose Robertson was very highly regarded by his fellow practitioners and clients alike, and his death has brought many expressions of sympathy from all classes of society. As one who was through College with him and who was a personal friend of his, I can truly say that to meet him in his home was to know his

uprightness and true worth and to appreciate his genial disposition and ready smile. The profound sympathy of all who knew him will be extended to his widow and little girl and to his parents in this, their very sad bereavement."

The funeral took place at Stourbridge Cemetery on March 23rd, when the following members of the profession were present: Messrs. D. J. Anthony, Brierley Hill; Howard W. Dawes, West Bromwich; H. W. Griffiths, Birmingham; J. Hepburn, Kidderminster (Assistant to Captain Robertson); J. A. McLauchlan, Stourport-on-Severn; E. S. Patterson, Windsor; Walter Scott, Worcester; and H. Yeomans, Birmingham.

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LEGAL NOTES

Farm Sale and Contagious Abortion: Alleged Fraudulent Representation.—An action to recover damages for alleged fraudulent representation, brought by Mr. Alfred Herbert Moore, dairy farmer, of Old Ditcham Farm, Petersfield, against Mrs. Edith Bridger and her son, Mr. Herbert Bridger, of Holemea, Easebourne, Midhurst, was heard in the Chancery Division before Mr. Justice Simonds recently.

Mr. Moore complained that he had been induced to enter into an agreement in November, 1936, to buy from Mrs. Bridger the farming stock of Old Ditcham Farm by the "false and fraudulent" assurances of her son, Mr. Herbert Bridger, and her cowman, Whitefield, that the cows were free from the disease known as contagious abortion.

Mr. Herbert Bridger denied the allegation, and both defendants said that Whitefield had no authority to make statements on their behalf, and that if he did so it was without their knowledge.

Mr. Norman Daynes, K.C., for Mr. Moore, said that contagious abortion was the scourge of the dairy farmer. So far as scientific knowledge went, there was no medicine or drug which could be usefully employed. Inoculation reduced the danger of contagion, but was not always successful in averting it.

In October, 1936, Mr. Moore was looking for a farm, and paid two visits to Petersfield. He relied upon the assurances of Mr. Herbert Bridger and Whitefield that no cow had aborted and that the animals were free from the disease. Induced by these representations, he bought the farm and certain stock from Mrs. Bridger, including a herd of 52 cows. He paid Mrs. Bridger sums aggregating £2,463 10s. The representations were false. Seven cows had aborted between December, 1935, and the date of the agreement, and six subsequently. Blood tests were made, and several of the animals gave positive reactions. Mr. Daynes said that Whitefield had confessed that what he had said was untrue. Whitefield would be called, and would say that just before Mr. Moore's visit he was told by Mr. Owen Bridger, another son of Mrs. Bridger, that if he was asked anything he was to say he knew nothing about it.

Mr. Moore, giving evidence, said that the representations made to him were quite definite.

Edmund Frank Creese, carter, employed at Old Ditcham Farm, said that in the last twelve months the Bridgers were there seven cases of cows slipping their calves occurred. He was told by Mr. Owen Bridger not to talk about it. On the eve of Mr. Moore's visit Mr. Owen Bridger told him if he was asked anything about the trouble to "say nothing; know nothing."

Mr. Andrew Clark (for the defendants) said that Mr. Owen Bridger would deny ever saying anything of the sort.

Dan Smaldon Whitefield declared that Mr. Owen Bridger instructed him that if anybody asked about abortion on the farm to say that there was none. "I carried out my instructions," he added. He knew of five cases of "slipping" or premature birth on the farm between February and November, 1936.

Other witnesses also spoke of cases of abortion on the farm.

Mr. J. F. D. Tutt, veterinary surgeon, Winchester, called by the plaintiff, said that the disease was usually contracted from infected pasture. In cross-examination, he agreed that many ordinary working farmers would not recognise the disease or did not trouble about it. He would say that they were careless farmers. Generally speaking, 90 per cent. of abortion by cows was attributable to contagious abortion.

Mr. P. M. Hall, of Messrs. Hall, Pain & Foster, surveyors, of Portsmouth and Petersfield, said he inspected the farm on behalf of Mr. Moore. He wished to make certain that the cows were free from disease, and asked Whitefield if there had been any case of abortion. Whitefield said there had been none, and, asked if he was absolutely certain, he replied that there had been none at all.

Mrs. Bridger, giving evidence, declared that she was most surprised when Mr. Moore issued his writ. She never told anybody to keep information back from Mr. Moore. She did not know there was anything to keep back.

Mr. Herbert Bridger said that when he was at Old Ditcham Farm he did not know what contagious abortion meant. He thought a slipped calf was a natural thing which could not be helped. He remembered only two cases in the twelve months. Mr. Moore said something to him about abortion, but he had never heard the word before, and said they had had none. He had no intention to conceal anything. It was untrue that he had ever instructed farm hands to conceal anything from Mr. Moore. He had no reason to do so.

Robert George White, cowman, in the employ of Mrs. Bridger from November, 1934, to November, 1936, said there were only three cases of slipping during that period.

Ernest George Silvester, another cowman employed by Mrs. Bridger for six months in 1934 and four months ending January, 1936, said there was no case of slipping while he was there. Mrs. Bridger's herd was one of the best and cleanest he had ever seen.

Mr. Owen Bridger, a son of Mrs. Bridger, said he was brought up on Old Ditcham Farm. At the time in question he did not know what contagious abortion was. It was absolutely untrue that he told Whitefield or Creese not to say anything about it.

Mr. Charles Henry Spurgeon, veterinary surgeon, Petworth, and inspector of contagious diseases in cattle under the Ministry of Agriculture, said he had made a special study of contagious abortion. It was his experience that about 80 per cent. of the herds throughout the country were infected with the disease. He did not think that farmers treated the matter seriously enough. Those who had slips two or three times a year invariably did nothing about it. That number was quite usual in a herd of 50.

Mr. James Mitchell, farmer, of Didling, said he had a herd of 240 cows. There were more slips in extremely hot or extremely wet weather.

There was nothing unusual in three or four slips a year out of a herd of 50. That would be quite normal. He had never heard of a commercial herd of cows being sold with a warranty that it was free from contagious abortion.

The Judge held that the alleged representations were made, and that they were false to the knowledge of the persons who made them. He had no hesitation in accepting the evidence of Mr. Moore and his witnesses. Mrs. Bridger was not guilty of any fraud or impropriety, but she was responsible for the acts of her agents. The defendants must pay the costs of the action, and there would be an enquiry as to damages, the costs of which would be reserved.

Mr. Andrew Clark said that experts on either side would endeavour to come to some arrangement as to the amount of the damages.

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VALUE OF PURE MILK SUPPLY?

In *The Times* of March 24th, 1939, Mr. Walter Elliot, Minister of Health, is reported to have said that "Milk was a primary food which nothing could replace. A supply sufficiently clean and safe for the medical profession to have confidence in it was one of the most important factors in the extended use of milk, and every effort must be made to see that a supply of such milk was available.

"The consumption of milk by children had gone up. The number of tested herds was rising rapidly, and the State veterinary service was carried out by whole-time, instead of part-time, veterinary officers. They were keeping up the pressure on agriculturists to make sure that the premises in which milk was produced were of higher quality."

Such statements emphasise the absence of co-ordination and co-operation between the Ministry of Health and the Ministry of Agriculture. What is the use of the veterinary profession and milk producers striving to obtain milk "sufficiently clean and safe for the medical profession to have confidence in it" when no effort is made to see that this high-grade milk is delivered to schoolchildren, etc., before it is adulterated by bulking with non-designated milk? This is surely a glaring instance of wasted effort and money and yet the solution of this problem should not prove insuperable.

It is a sad reflection also that the Minister of Health (previously Minister of Agriculture) should be under the impression that the State veterinary service was carried out by whole-time veterinary officers. At the moment at least 50 per cent. of the work of inspection is done by the part-time veterinary officers. We trust that Mr. Elliot's statement was a genuine mistake. It is a pity that when effective collaboration exists between whole-time and part-time men, as it does to-day, the Minister of Health should not be able to apportion the praise accordingly.

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OVER 4,000 GALLONS IN A YEAR

World-Record Holder's New Achievement

Cherry, the Shorthorn cow belonging to Messrs. Worth & Way, of Amesbury, which in the last few weeks has beaten successively the British and world's records for a year's milk yield, on March 22nd became the first cow known to have exceeded 4,000 gallons of milk in a year. Her exact yield on the evening of that day reached 40,017 lb., and she had still more than two weeks to go before the 365 days were up.

The world's record, which she broke earlier last month, was a yield of 38,606 lb. held by the American Holstein Friesian cow, Carnation Ormesday Butter King. The British record which she exceeded was held by Lord Rayleigh's British-Friesian Terling Gracetul 10th.

Cherry has no pedigree. She was bought at an ordinary auction sale at Salisbury six years ago.

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ARMY VETERINARY SERVICE

London Gazette—War Office—Territorial Army

March 28th.—Lieutenant W. S. Codrington to be Captain. (June 24th, 1938.)

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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CO-OPERATION WITH THE PEOPLE'S DISPENSARY FOR SICK ANIMALS

To the Editor of the Veterinary Record

Sir,—I should like to congratulate Mr. T. A. R. Chipperfield on his letter in the *Veterinary Record* of March 25th: he has put forward the feelings of the average practitioner in a most fair and unbiased manner.

It seems to me that there are two objections to the present scheme of co-operation with the People's Dispensary for Sick Animals, one ethical, the other practical.

The rules governing our profession's attitude towards quacks are of long standing, and have stood the test of time very well. It is at least open to discussion how far a governing body, elected by the profession, is wise to alter these rules without the fore-knowledge or secured approval of the profession. In my opinion the position would have been very different had our Council, when negotiating with the P.D.S.A., secured either directly or indirectly from them definite and practicable proposals, before undertaking to breach the wall that has up till now divided the qualified practitioner from the quack.

As for the practical objection, I for one should feel happier about the scheme if the P.D.S.A. had retained its terminating two P.P.s—the first signifying "Poor." No Body has been more successful in its appeals to the charitable generosity of the public, and I venture to assert that this success would have been considerably modified had the public realised the true attitude of our profession towards the animals of the poor. I have never refused to treat such a patient for little or no fee, and have never met a veterinary surgeon who was not prepared to do the same.

The practitioner is not subsidised by public subscription and has his living to make. Before he consents to the proposed scheme of co-operation, he has a right to insist on some very unequivocal and binding guarantees from the governing body of the P.D.S.A.

In another letter appearing in the *Veterinary Record* of March 25th, Lady Terrington, speaking at Hastings, is quoted as saying: "It does not matter whether an animal belongs to a

millionaire or a pauper, it can be taken to the P.D.S.A. for nothing. There is just a box with the words 'Thank You.'" If this statement correctly represents the policy of the Society, I suggest that the P.D.S.A., having arranged to cut the practitioner's throat, is blandly asking him to lend a scalpel for that purpose.

If, on the other hand, the P.D.S.A. intends honourably to confine its activities to the treatment of animals whose owners cannot afford a fee (for which purpose, by the way, the public was persuaded to subscribe its money) it appears to me that such statements as Lady Terrington's should be contradicted in print, and as publicly as possible. Also it would be as well to prevent irresponsible persons from making such statements.

My setting forth what appear to me to be the chief objections to the present position, does not mean that I am against the idea of a rapprochement between our profession and the P.D.S.A. On the contrary, I am of opinion that a working basis might be found, by which benefit would accrue to the animals of the poor and to both parties.

Yours faithfully,
S. F. J. Hodgman, M.R.C.V.S.

101, Bromley Road,
Shortlands,
Kent.

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To the Editor of the Veterinary Record

Sir,—Opinions have been expressed that this question should be well discussed in your pages, so here goes.

There is an old and valuable saying that "it is no use trying to put your foot down if you have not a leg to stand on." At present the profession has no means of discerning which party to the proposed alliance between the People's Dispensary for Sick Animals and the general practitioner has the better legs to stand on—opinions may exist, but no facts are brought forward.

One cannot say whether the leaders of our profession will be better diplomatists than, or as good as, the representatives of the P.D.S.A. There are a great many objectionable and unethical things done under the guise of progress.

One statement that needs "pinning to the counter" as inaccurate is that the help given to our profession by the Royal Society for the Prevention of Cruelty to Animals is on the same footing as that of the P.D.S.A. The R.S.P.C.A. or their agents have never treated animal cases wholesale or at all and then decided in their wisdom that a certain percentage of them should be allocated to the local practitioners. There is a friendly and manly agreement at present existing in many localities between the R.S.P.C.A. and local practitioners.

Major Kirk's eight points may all be criticised:—

(1) "The working hand-in-hand" business has not yet been defined and detailed and it therefore cannot be accepted as a fixed procedure.

(2) Previous approach and suggestion to the P.D.S.A. have been ignored by that body.

(3) The work that many veterinary surgeons have done and the sacrifices they have already made in the interests of many poor people are known to not a few members of the public, and public opinion is not all on one side, especially if it is intelligent.

(4) The "logic" of number four is based on incomplete knowledge of the facts and does not seem logical at all to me.

(5) What will the P.D.S.A. think if, as Major Kirk suggests, "there would under such a scheme (if it materialises) be no further room for such men in our national life"?

(6) It remains to be seen whether antipathy will decline as negotiations proceed.

(7) It may be to the practitioner's honour and credit as a man and a gentleman that ever since 1918 he has stood to lose practice. A worthwhile profession should be proud of such men.

(8) The pecuniary reasons may also include the magnanimous and charitable ones.

(9) The "lasting service" is all in the air at present.

As regards the veterinary profession standing "aloof," I think the aloofness was quite mutual.

To quote the St. John Ambulance Society and the Red Cross procedures as against that of the P.D.S.A. simply begs the question, as does also the reference to the R.S.P.C.A. All these bodies have from *the first* recognised their limitations and adhered to them.

The breach of By-law 53 cannot arise until the by-law is broken.

One wonders how many veterinary surgeons have yet received a flow of cases from Mr. Bridges-Webb as a result of his instructions, and how they (the veterinary surgeons) have gone on. A narrative of their adventures would be interesting.

It is rather humorous Major Kirk telling us that "people that come to hasty conclusions are proverbially liable to be in error." "Lack of knowledge and foresight" are likely enough not to be confined to critics of the present position, hazy as it undoubtedly is.

Yours faithfully,
G. Mayall.

Bolton.

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To the Editor of the Veterinary Record

Sir,—It is exceedingly unfortunate that, through an inexcusable blunder on the part of the Royal College of Veterinary Surgeons, opinions regarding the above should have to be ventilated in the *Record* instead of "in committee" at meetings of the National Veterinary Medical Association and its Divisions.

In an attempt to avoid publicity at such a critical stage, my partners and I wrote to Mr. Livesey, in reply to his doubtfully confidential letter, expressing our disapproval of the manner in which the R.C.V.S. had exceeded its duty in formulating a scheme with the People's Dispensary for Sick Animals, and requesting that further action be delayed. We felt that, even if the scheme were sound, the way in which it had been evolved vitiated its chance of success. However, the cat had apparently already escaped from the unsealed envelope, and I consider it necessary therefore to write again supporting those practitioners who have so aptly criticised the scheme and its evolution in your paper.

Major Kirk's two explanatory letters still leave the critics with, what he calls, "a lack of inside knowledge," for in spite of reputed "lack of foresight" one cannot help suspecting that there is some undisclosed reason for the P.D.S.A. approaching the R.C.V.S.

One cannot be expected to believe the statement contained in his first letter that "those who, for any reason wish to remain outside the

scheme will not be in the least embarrassed or at a disadvantage in consequence," when in his next letter he writes, "To have bluntly refused to co-operate in the care of the poor people's animals after having been invited would have raised a storm of national protest, etc."

He assures us, too, that "there is no scheme" and then adds, "in the meantime we have been given an assurance by Mr. Bridges-Webb that all employees of the P.D.S.A. have received definite instructions to pass on to a qualified man every case which cannot easily be diagnosed."

If there is no scheme it would appear that these instructions are premature.

Much, if not all, of the present confusion and criticism could have been avoided if the R.C.V.S. had consulted the practitioners at the outset of negotiations, for until all the facts are in our possession and we are convinced that the interests of the profession are safeguarded in every way, the co-operation of the practitioner cannot be expected.

Yours faithfully,
C. R. Golledge.

Staddlecote,
Trowbridge, Wilts.
March 27th, 1939.

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To the Editor of the Veterinary Record

Sir,—It is very gratifying to find that Major Hamilton Kirk does not consider it "altogether astonishing" that members of the profession should have regarded the President's letter as a surprise.

May I ask if he is conversant with the memorandum which I have received from the President of the Royal College of Veterinary Surgeons regarding the People's Dispensary for Sick Animals' proposals? I should suggest that he read them carefully.

I find it very difficult to interpret his two long letters as anything other than a very poor defence of what is, in my opinion, and in the opinion of a number of other members with whom I have communication, a very ill-advised action on the part of the Council, and one that may place the future of our profession in jeopardy.

These negotiations, we are told, took place over a period of months. Why was it not possible during those months to consult the practising members of the profession?

Our profession, in the past, has objected strongly to animals being treated by men who have not the knowledge and scientific training of veterinary surgeons. What improvement is there to be as a result of this scheme? The answer is—a proportion of the cases which in the opinion of a technical officer of the Society can, with advantage, be sent to a veterinary surgeon will be passed on, if and when he recognises that necessity.

Is there to be any check on the confusion that I think we all agree exists in the minds of the public as to whether the officials of these clinics are veterinary surgeons or not? Is there to be any check on the abuse of this charity by those people able to pay? Is our profession to have any part in the direction and future conduct of this charity in return for our co-operation?

Major Hamilton Kirk states that we cannot stand aloof. This statement is an unworthy reflection on those of our members who have met this Society's activities and have counteracted them by advertising freely their own willingness to give qualified veterinary services without fee to deserving cases in their own surgeries or at clinics run by the R.S.P.C.A. and other societies where they act for the main part in honorary capacities.

I am certain that no member of our profession would refuse free treatment to the deserving poor.

Why is it that the Council have never had the courage to take the public into its confidence and tell them the facts?

Major Hamilton Kirk, Professor Wright, and Professor McCunn all stress "sick and ailing animals" in their letters. Such sentimental passages can only be interpreted, in my opinion (to use a Hampshire phrase) as "cattle cake for the masses" when used as the primary argument in connection with the activities of a society with which I believe the Council have had no constructive contact for 21 years. Qualified services for sick animals of the poor can be rendered available without the need for a special resolution from the Council granting the members the doubtful privilege of being "unethically" ethical to enable this work to be carried out.

Major Hamilton Kirk stresses analogy with the permission granted by the Council for members to co-operate with the R.S.P.C.A. in establishing clinics for poor people. In the memorandum referred to it is pointed out that there is no analogy. In my experience the R.S.P.C.A. does not undertake the treatment of sick animals by lay staff but employs veterinary surgeons in a paid, or more frequently, honorary capacity. It is quite obvious, therefore, that there can be no question of drawing invidious distinctions between the two societies! Major Hamilton Kirk has given what he considers to be a satisfactory explanation of why secrecy was necessary. May I remind him that this secrecy precluded all criticism and co-operation in the drafting of any proposals that may have been considered advisable. Is it not obvious that this secrecy was a contribution to clever propaganda aided and abetted by the Council? Is he quite certain that this advertising stunt is worth the criticism with which the proposals have since been met?

In regard to his suggestion that "outside factions would spare no pains to wreck good relations," does not this statement, on reflection, appear ridiculously melodramatic? I venture to suggest that there could and would be no voice raised in protest provided collaboration was rendered possible without the necessity for an exceptional ruling contravening the accepted ethics of our profession and provided that it gave our profession some measure of discretion as to which cases were deserving of free treatment.

It is extremely gratifying to read that those who remain "outside this scheme will not be embarrassed or at a disadvantage in consequence." Is this to be taken as an assurance received after the suggestion was raised by the Committee of that being a possible sequel? Does he consider that statement a dignified one? This most charitable assurance will, I am sure, be most acceptable to those practitioners who still retain confidence in their own ability and their self-respect.

What are to be considered "operations of most trivial character"? Are we to take it that at the moment there is no written agreement or that this action of the Council has been taken with mere verbal assurances unspecified in his letters up to the moment?

Major Hamilton Kirk elaborates nine points, none of which is impressive. In regard to point 1: It is obvious that the veterinary profession will only have supervision over that proportion of cases sent to it at the discretion of technical officers. Point 2: Scorn could be a weapon used by either side. 3: I am not at all certain that public opinion, if raised in protest, could not have been answered in a way that would have been to the advantage of our profession. The British public is fair-minded once they are told the facts. 4: This I have already answered. 5: I have yet to see how this scheme is to remove quacks from our national life. 6: Antipathy to the P.D.S.A. has been solely on account of the promiscuous treatment of the animals of both rich and poor and the employment of unqualified men to give such treatment. 7: A number of practitioners have occasioned no loss in consequence of P.D.S.A. activities. I venture to suggest that if treatment was limited to deserving cases no practitioner would lose financially. Major Hamilton Kirk makes this pecuniary point an argument in his favour. 8: Major Hamilton Kirk here requests us not to hold aloof for "pecuniary reasons." 9: This point is one of sickly sentiment, which may be good publicity in the lay Press but is not a practical argument when debating whether animals shall receive anything other than qualified veterinary services *with the consent of the controlling body of the R.C.V.S.*

I must ask Major Hamilton Kirk to accept my assurance that I have no "pecuniary motive" in opposing this scheme. My interest is simply that I, and a considerable number of practitioners known to me, do not consider this scheme to be in the best interests of our profession.

With a view to taking a more active part in serving these interests I have been nominated for election to the Council of the R.C.V.S. at a somewhat late date. If elected it is my intention to continue to do all in my power to serve the interests of our profession.

Major Hamilton Kirk repeatedly refers in his letters to "inside knowledge and foresight," and appears to imply that critics of this scheme are devoid of both. In regard to the former I gained quite a lot from him and another member of the Council when this matter was discussed at the Southern Counties Veterinary Society meeting at Salisbury *in committee* and in private conversation with three other members afterwards.

In regard to the latter I find it difficult to reconcile "foresight" and inferiority complex.

May I suggest that instead of elaborating nine very unimpressive points he now writes a letter making public the "inside information" which he constantly refers to and that he tabulates the "assurances" made to, and received from, the Society.

Can he tell us if, in his opinion, a professional man can accept fees from a society employing a large number of unqualified practitioners in diagnosis and treatment and yet still retain dignity?

It seems to me he wants to eat his cake and still have it.

He denies that this scheme "will be tantamount to raising employees of the P.D.S.A. to a professional status," but he omits the qualifying words, used in my letter, "in the eyes of the public." Will he deny that the public are already confused as to the status of these employees? In my experience most people refer to them as veterinary surgeons. I think it is obvious that a loose but closer association is bound to increase that impression "in the eyes of the public."

I agree that the P.D.S.A. have done well without us but it is my contention that with our backing they will go ahead by leaps and bounds and, possibly, some practices will suffer more seriously than they have done in the past and others which have not been worried *will be worried*, with the scheme in its present form.

Major Kirk "hopes" that the training of the "lay staff will now be revised." Surely before committing us to any agreement whatsoever, an assurance on this point should have been received. Am I to believe seriously that Major Kirk thinks that the conduct of the P.D.S.A. is analogous to that of the St. John Ambulance and the Red Cross Society? I think it would be as well if he made a few enquiries as to the aims and objects of these two societies, and their conduct.

In regard to his point concerning agricultural colleges and the Ministry of Agriculture, to my knowledge neither train lay persons to undertake diagnosis and treatment of sick animals as *a means of livelihood*, neither do they subsidise such treatment by employing their former pupils in this work.

Both Professor Wright and Professor McCunn have written in support of this scheme; neither of them is very reassuring, since their arguments hint at some of the "inside information" which Major Kirk gave us at Salisbury, which I am convinced in its present intent is not in the best interests of the profession. Would they explain how close collaboration with a society which employs unqualified men can possibly be associated with "*doing something worth while*" in regard to the evil of the "*quack animal doctor.*"

May I suggest that they are straining at a gnat and swallowing a camel. Which is the more objectionable, individual unqualified practitioners, who have always existed, or a large number of unqualified men whose livelihood is guaranteed by a wealthy society which indulges in very clever propaganda?

Once again might I request that the profession be told the whole facts without reservation, including an account of the "certain existing conditions which would have been unacceptable to the profession," which Major Hamilton Kirk claims the negotiations have eliminated.

I have no wish to "condemn persons," but I do condemn what I know of this scheme in its present form and intent.

To be constructive, may I suggest that a scheme whereby an invitation was extended by the Society to all Members of the profession to collaborate in their work and become Honorary Veterinary Surgeons of the P.D.S.A. Clinics, wherever they existed, should be possible.

For those cases in which it was necessary from special circumstances or the scope of the work required payment could be made by the Society. I feel certain that our Members *would give their services freely provided an undertaking was received that no diagnosis was made, or treatment prescribed by lay persons* employed by the Society and provided that the veterinary surgeon had the right to *request investigation* into the circumstances (with a view to subsequent refusal of free treatment), of any person claiming free treatment whom he had reason to think was not entitled to it.

In regard to the present technical officers, who obviously create some difficulty, it should be possible to employ some of them in the hospitals already established with a visiting

honorary or paid veterinary staff to supervise their work. Those less experienced could be utilised as almoners, superintendents, and dressers in clinics working under the direction and supervision of honorary veterinary surgeons in whom the responsibility for all diagnosis and treatment would be vested.

If these possibilities were found inacceptable, it might be possible to provide some dispensation for a limited period provided no further officers were created, so that eventually the difficulty would solve itself.

I feel quite certain that with goodwill on both sides a scheme on these lines could be elaborated which would be of the greatest possible benefit to all the animals of the poor, of great advantage to the Society with whose *stated* object we as a profession are deeply sympathetic, and at the same time it would allow our profession to preserve its status and ethics without loss of dignity, and without jeopardising its future.

Yours faithfully,
GEO. N. GOULD (JUN.), M.R.C.V.S.

"Rockholme,"
10, Landguard Road,
Southampton.
March 28th, 1939.

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TO THE EDITOR OF THE VETERINARY RECORD

Sir,—Why the Royal College of Veterinary Surgeons has conceived such a revolutionary idea as covering and assisting quacks passes understanding. I most strongly object.

This will give the People's Dispensary for Sick Animals a professional standing which they will not be slow to advertise—greatly, of course, to the detriment of the local practitioner in any Provincial town where they have a dispensary.

If the P.D.S.A. only attended really poor people's animals, it would be a different matter. The veterinary surgeon is at a serious discount as he may not advertise—it is only fair to allow a veterinary surgeon to advertise, in local papers, his address if nothing else. Soon there will be no country veterinary surgeons left. I have been in practice well over 50 years: the changes in the last few have been stupendous.

We want all the help that the R.C.V.S. can give us instead of working against us.

Yours faithfully,
ELMER EBBETTS.

Rochester,
March 22nd, 1939.

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TO THE EDITOR OF THE VETERINARY RECORD

Sir,—I wonder how many of the gentlemen responsible for this sudden and unexpected product of "appeasement policy" realise that some 50 per cent. of even the better educated of the British public have not the slightest conception of what is meant by the term "veterinary surgeon," and that even a greater percentage have no knowledge of the training required to qualify for that title.

If the Council of our profession intend to launch a campaign of wholesale covering might they not be unprofessional to better effect were they to undertake a little subtle advertising of our profession to offset the wholesale appeals to public sentimentality sponsored by innumerable animal clinics?

The way to deal with quackery is to educate the public to differentiate between the qualified and the unqualified. This result is hardly likely to acrue from the raising of the clinics to a semi-professional status.

Yours faithfully,
R. W. ROACH.

16, Mount View Road,
Chingford,
E.4.
March 20th, 1939.

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TO THE EDITOR OF THE VETERINARY RECORD

Sir,—As Mr. Paul Crosfield so aptly remarks in his letter of March 25th—the cat is out of the bag, and as the schoolboy said, it is "emitting 'whelps' at every bound!" This cat, I fear, should have been unsexed in early life, preferably by a *qualified* man.

It is with great surprise that I read letters by such exalted personages as Professor J. G. Wright and Dr. J. McCunn. I have had the privilege of being one of their students and therefore I can hardly realise that they are favouring the P.D.S.A. scheme.

What scanty instruction the College gave us with regard to professional matters was, in my day, administered by Professor Wright. As far as I know this was not one of his duties, but was done because he wanted his students to become professional men in word and deed. He took a pride in it and some of us are grateful. It was for this reason that some of us youngsters said, as soon as we read the President's letter, "John George will not stand for this." Then *mirabile dictu*, our anti-quack, our professional paragon, is found to be singing in chorus with the others.

I would like to point out to Professor McCunn that the "dear little doggy" stuff is quite a futile line to take with our profession. Some of us, thank goodness, have a real job of work to do. He mentions our little doggies and pussies having a vote in the matter. Believe me, if this were the case, the cats would be too occupied in passing anti-castration laws to worry about the P.D.S.A.

Since this controversy started I have re-read the wording of my diploma. I find that I am qualified to practice the ART and SCIENCE of veterinary medicine, etc. Well, if consorting with quacks for the sake of my pocket is the ART, then give me the SCIENCE.

Yours faithfully,
K. G. MORGAN.

49, Chetwynd Drive,
Bassett,
Southampton.
March 27th, 1939.

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THE EXAMINATION OF THE HEART

TO THE EDITOR OF THE VETERINARY RECORD

Sir,—The valuable clinical paper by Professor McCunn on "The Examination of the Heart," presented at the Annual General Meeting of the Royal Counties Veterinary Medical Association, must have proved particularly interesting to all present, and in response to Professor McCunn's suggestion that the subject should be discussed further in the columns of the Association's journal, I would like to ask the following questions:—

(1) In view of the "all or none" response of cardiac muscle, is it not a fact that the heart can never improve beyond a certain point unless adequate exercise is given? In other words, as with all disused voluntary muscles, the functioning of cardiac muscle cannot be normal unless it is adequately exercised.

I know that this applies, in particular, to the modern treatment for *angina pectoris*, or other forms of cardiac embolism in man, and I think this should be one of the first principles to be adopted where advice concerning heart disease is being given.

(2) The examination of the heart with the patient at rest may give absolutely no indication as to its conduct during exercise, and indeed the compensatory powers of the heart can never be judged unless it is examined both before and after exercise. In this event, are not many practitioners misleading themselves into merely examining animals at rest?

(3) What is the commonest cause of the jugular pulse so often seen in the dairy cow?

(4) "Palpitation is the outward sign of an embarrassed myocardium." Is it not a fact that there are certain forms of palpitation in man for which no plausible explanation can be given, beyond assuming some irritative condition of the sympathetic nervous system?

Yours faithfully,
W. P. Blount.

County Hall,
Lewes.
March 28th, 1939.

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TREATMENT OF STERILITY

To the Editor of the Veterinary Record

Sir,—In the discussion which followed the paper by Professor Nicholson published in your issue for March 11th, Professor Browne is reported to have stated that there was no information on the value of the use of wheat germ oil (vitamin E)—he mentioned other products too—in the larger animals. I may have misinterpreted his meaning, but the very first communication on wheat germ oil was from P. Vogt-Moller and F. Bray in the *Veterinary Journal* (1931, pp. 165-170) on cattle. In the *Veterinary Journal* (1933, p. 416) I reported cases on which it had been tried and drew conclusions as to its value and when it should be used, which subsequent experiences have not modified. Others too have, so far as I know, endorsed them.

In the use of glandular products it is just as important not to over-dose as to under-dose, and to treat each case on its merits.

Professor Browne rightly refers to the danger, and not always the ease, with which a persisting corpus luteum may be expressed, and I take this opportunity of drawing the attention of colleagues to a new preparation of one of the sexual hormones, *viz.*, oestradiol benzoate in oily solution,* which in many cases dispenses with the necessity of the operator expressing it. This preparation has been subjected to extensive trial by Abelein in the course of field work in the province of Upper Bavaria in herds infected with trichomoniasis.

In the course of the admirable paper which he published, Mr. G. N. Gould advised treatment with solutions of lactic acid, having found the various iodine solutions of little value, although German workers have claimed that the intra-uterine injections of Lugol's was specific. The subsequent work has shown that the efficacy of all these cannot be compared with the irrigation of the uterus with Entozon, 1 : 3,000, and in the case of mares, especially where strains of haemolytic streptococci are present, I pin my faith to this preparation.

Yours faithfully,
J. F. D. Tutt, F.R.C.V.S.

"Rothiemurchus,"
St. Cross,
Winchester.

*The preparation used was "Provetan" (Schering).

DISEASES OF ANIMALS ACTS, 1894 to 1937, and AGRICULTURE ACT of 1937 (PART IV)

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1st to 15th Mar., 1939	31	33	3	216	3	8	10	68	38
Corresponding period in 1938	44	45	2	100	2	8	9	16	6
1937	36	43	—	—	9	9	8	51	33
1936	27	34	—	—	12	42	7	61	60
Total 1st January to 15th Mar., 1939	208	220	29	4,262	17	33	129	277	164
Corresponding period in 1938	215	222	103	14,659	27	42	75	82	33
1937	155	177	3	262	53	83	90	250	155
1936	122	153	4	379	46	159	113	434	277

Note.—The figures for the current year are approximate only.

§ Excluding outbreaks in Army Horses.